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ABSTRACT

Seven papers examine a number of issues that have dominated school finance research and policy in the 1970s. Among the topics covered are revenue limitation movements and school finance reform, with papers on experiences in California and Nevada; educational equity, including equity in both taxpayer rates and expenditures per student; price indices for educational inputs measures of school district wealth and the effects of urban fiscal stress on educational financing. A preface briefly summarizes the papers. (Author/RW)

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Selected Papers in School Finance

1981

Working Papers

March 1981

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PREFACE

The papers appearing in this edition of Selected Papers in School Finance reflect the variety of issues that have dominated school finance research and policy concerns in recent years. The revenue limitation movement in California that received national prominence as a result of the passage of Proposition 13, is the subject of the first paper. Equity in raising funds for schools and distribution of resources to school children is the central concern in several papers. Two additional papers on timely topics complete the volume, one of which deals with local education cost differences and their measurement, and the other with the relevance of municipal overburden in school financing.

Gerald Hayward has provided in rich detail an account of the underlying conditions and political forces that led to the adoption of the now familiar Proposition 13. The paper traces the history of the revenue limitation movement in California that goes back to 1968 and describes the early ramifications of adoption of Proposition 13, a decade later.

G. Alan Hickrod et al. measure the performance of the school finance systems in three States for a period that spans most of the decade of the seventies. The States are compared for their achievements on three equity goals, namely reductions in disparities among school districts in tax rates and in school expenditures, and achievements in wealth neutrality. The results of their analysis strongly suggest to the authors that state progress towards equity depends on the way the equity goal is implemented and on the pattern of school district organization. "Fiscal policies designed to reduce expenditure disparities may or may not contribute to wealth neutrality....States with separate elementary and high school districts, as well as K-12 districts have probably aggrevated their equity problem by this form of administrative organization."

In their article, Leanna Stiefel and Robert Berne have built on previous research analyzing local price differences among school districts in Michigan by utilizing an expanded data base covering virtually all the school districts in that State. Using the same methodology as that of Harvey Brazer and Ann Anderson,[1/] the authors have observed that their findings yielded an index of district salary differences quite similar to the index constructed by Brazer and Anderson, which had been based solely on a sample of school districts. Further, the district price indices showed a remarkable stability over time, and minor alterations in the specifications of the equations upon which the indices were based produced little change in the calculated index number for each district. Given that most States have the required district data readily available, this methodology becomes a useful and inexpensive measurement tool for calculating the effect of local price differences on school expenditures.

In recent years, the school finance literature on State developments has tended to focus attention on a relatively small number of States while the remaining States fell into an information void. In this edition, a report on the school finance system in Nevada, prepared by Glen Atkinson and Thomas Sears, is included that provides information on the school finance system

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[1/] See Selected Papers in School Finance, U.S. Department of Health, Education and Welfare/Office of Education, the 1974 and 1975 editions.

and issues in one of the "unknown" States. Since the paper was written, the Nevada voters have rejected a proposal to radically cut local property taxes in November 1980. Currently, school districts are operating under a revenue cap for property taxes imposed by the State Legislature.

In their paper, Richard Aronson and John Hilley analyze district power equalizing and wealth neutral systems of financial aid to school districts. The analysis shows that both systems lead to a wealth related bias in the treatment of taxpayers. The nature of the bias depends on the responsiveness of a school district's level of expenditure to school district fiscal capacity and the price of education. Drawing on empirical estimates from Pennsylvania school districts, the authors show that the achievement of wealth neutrality would require poor school districts to face higher tax rates than wealthy school districts. They conclude that a conflict exists between the achievement of student equity and taxpayer equity under a system of wealth neutrality.

Alternative specifications of local wealth and the distributive consequences for State aid are analyzed by Robert Thornton. Income is incorporated in an expanded measure of local wealth, and the question of the appropriate weights to attach to income and property in indices of school district fiscal capacity is examined. Empirical data from a number of States are included and the consequences of using alternative fiscal capacity measures are analyzed for the various types of schools in these states.

The final paper in this volume concerns a recurrent topic in school finance issues. James Knickman and Andrew Reschovsky explore the impact of urban fiscal stress on the financing of public education. The authors view existing municipal overburden measures as deficient and propose an alternative that defines fiscal stress in terms of the fiscal effort necessary to provide a "minimum bundle" of public services. Little evidence exists that links fiscal stress with education spending levels. Courts, however, may require that state education funding systems be adapted to account for municipal overburden. In the authors' view, court mandated remedies may be very costly or may require States to mandate education spending levels.

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THE REVENUE LIMITATION MOVEMENT IN CALIFORNIA: 1968-1978*

I. Introduction

On June 6, 1978, the voters of the State of California overwhelmingly approved the most significant property tax relief measure in the state's, and probably the country's, history. In spite of the opposition of most of the state's political leaders and over the protests of most locally elected officials, the voters approved a simplistic proposal which would remove $7 billion from the property tax rolls of the state, throw the state and local agencies of government into unprecedented turmoil and force government officials throughout the country to take notice.

In this paper, we will (1) examine the factors leading to this momentous political event, (2) analyze the Initiative, (3) explore the preliminary legislative response, (4) examine the short term impact on local agencies of government, and (5) speculate about the post Proposition 13 future.

The paper will have as a particular focus, the impact of Proposition 13 on schools. California's schools, more than any other local governmental entity were dependent on the property tax as a source of revenue and consequently were made the most vulnerable by its loss. In addition, California's school finance system has undergone

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The author gratefully acknowledges the assistance of legislative staff members, the Office of the Legislative Analyst and the Department of Finance in the preparation of this paper. Especially helpful have been Martin Helmke of the Senate Office of Research, Cliff Allenby of the Department of Finance and John Vickerman of the Office of the Legislative Analyst. Of course, any errors in this report are attributable solely to the author. Special thanks go to Pam Hawes, whose help was invaluable.
Finally, and most importantly, I wish to acknowledge publicly the truly extraordinary efforts of the Charman of the California Senate Finance Committee, Albert S. Rodda, in meeting the challenge of Proposition 13. Nobody could have done it better.

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a decade of change unmatched in its history. Of particular interest will be the ability of the school system to withstand what may well be its most serious challenge. We will also explore tax implications, the impact on local governmental entities other than schools and the implications for the state as a whole.

It is important to note the tentative and speculative nature of this paper. California is still in the midst of the first year of experience in the post Proposition 13 era. As this is written, the Legislature has not yet decided what kind of funding mechanisms will exist in the fiscal year commencing July 1 1979. Another statewide initiative calling for a spending limit on government has just qualified for the ballot and could conceivably be before the voters this summer. The double impact of an expenditure limitation on top of the massive property tax relief contained in Proposition 13 makes the future even more difficult to assess.

II. Roots

The "message of 13" was a popular rallying cry in political campaigns all over the nation in the fall of 1978. Depending on the campaigner and the campaign, Proposition 13 was a general tax revolt, or a property tax revolt, or an anti-government message, or an anti-politician peaceful revolution, or all of the above. It was alternately a blow against waste in government, against fluoride, against centralization, against corruption in government, or against lying politicians. It was, in sum, a protest against almost anything about taxes or government that anybody didn't like. Clearly, the "message of 13" was not clear. In this section we will examine five factors which may help explain why this Propostion succeeded where all its predecessors failed. All five are inextricably interwoven and mutually reinforcing. Starting with what is generally agreed to be the heart of the Proposition 13 movement — anti-tax sentiment (particularly the property tax) — we will explore four additional factors:

—The California initiative process which permits the voters to overrule the judgement of the Legislature in a direct, fairly simply manner;

—The disenchantment with government marked by increasing public concern over governmental expenditures and growing cynicism about the purposes and services of government;

—The inability of the Legislature to respond meaningfully and in a timely manner to the property tax problem;

—The California surplus which, like Topsy, just "growed and growed" much to the embarrassment of just about everybody except Howard Jarvis.

A. Taxes

The Governor's Budget for California proposes to spend $33.7 billion in 1979-80. That works out to above $92 million a day, or $1,470 for each Californian. The majority (about $17.1 billion) of the state's expenditures are funded from the state's General Fund, which is, in turn, funded by a variety of taxing sources. About 80% of the General Fund dollars will flow to local agencies of government (cities, counties, special districts and schools) to assist their operations. In addition, about $6.5 to 7.5 billion is expected to be generated from local property taxes in 1979-80.

If indeed, as widely touted, Proposition 13 was a taxpayer's revolt, it is important to review California's tax structure. The section which follows will include a description of the major tax sources of state and local revenue (including property taxes), a discussion of the phenomenal growth rate in some of those tax sources and a comparison of tax structure and growth rate of California with other states.

1. State Taxes[1] Total state 1978-79 fiscal year[2] revenue for California is anticipated to be approximately $17.1 billion. Of these funds, approximately $2.4 billion are special fund revenues[3] which can only be expended for specific purposes. The remaining $14.7

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[1] Governor's Budget, 1979-80

[2] California's fiscal year is from July 1 to June 30.

[3] Motor vehicle taxes and fees account for 78% of all special fund revenue, much of which is designated to be returned to local governments and for various state programs related to transportation and services to vehicle owners.

billion (about 85% of the total) is deposited in the General Fund which is then allocated by statute or through the annual budget bill for the general expenditures of the state. The major sources, sales and use, personal income, and bank and corporation taxes, provide over 85% of General Fund revenue[4]. The major tax sources, revenue produced, and pertinent provisions include:

a. Sales and Use Tax - $5.7 Billion. The California sales tax was enacted in 1933. The use tax was enacted in 1935 and has always been at the same rate as the sales tax. In 1955 an additional 1% was added which allowed cities and counties to impose a state administered sales and use tax. The sales tax is based on gross receipts from sales of tangible personal property for final consumption and the use tax is measured by the sales price of tangible personal property which is stored, used or otherwise consumed within the state.

The California rate has increased from its original 2-1/2% in 1933 to a rate of 6%. This rate now includes a 4-3/4% state rate, a 1% uniform local sales and use tax rate and a 1/4% county tax (included since 1972) to be used for the support of local transit systems[5]. Several items are exempted from the sales tax, including sales of natural gas, electricity, water, food for home consumption, newspapers, periodicals and prescription medicines.

The revenue generated by California's sales tax has historically paralleled the growth in California's personal income growth. However, since 1975-76 the growth in spending has occurred at a rate 50% greater than growth in personal income, reflecting a substantial increase in consumer debt. Sales tax revenues increased at the extraordinary rates of 15.1% in 1976-77 and 17.5% in 1977-78. The state's economic forecasters doubt such a high growth rate can be sustained.

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[4] Other taxes, such as taxes on insurance, inheritance and gifts, cigarettes, alcoholic beverages and parimutuel betting on horses, make up a significant portion of California revenue, but none provides enough revenue to be considered a reasonable alternative to the major sources cited above.

[5] Some areas of the state levy a 1/2 cent additional sales tax to support their local regional transit system.

b. Personal Income Tax - $4.7 Billion. The California personal income tax was originally enacted in 1935 at a rate which was graduated from 1% on taxable income under $5,000 to 15% on taxable income in excess of $250,000. Both the tax rates and the levels of income subject to taxation have changed significantly since enactment. The California law contains a low-income tax credit which exempts single persons with income less than $5,000 ($10,000 for married couples). The tax is currently imposed on net California taxable income (gross income less deductions) with tax rates ranging from 1% to 11%.

Because of the highly progressive nature of the California schedule and the high rate of inflation, income tax collections since 1974 far exceeded the growth in California personal income. As individuals moved upward through the income brackets, the impact on state revenues was quite dramatic. While California income grew by 10.55% in 1974, income tax collections in 1974-75 grew by over 40%! The next three years saw an average growth in personal income of slightly above 10% while revenues from the income tax grew by over 20% per year.

In 1978, in response to the Proposition 13 mood and growing taxpayer unrest about this phenomenon, the California Legislature enacted AB 3082 which provided for, among other things, an upward adjustment of income brackets by the annual percentage change in the California Consumer Price Index (C.C.P.I.) in excess of 3%. In addition, tax credits were increased by the annual percentage change in C.C.P.I. and a one time increase in personal income tax credit was granted. The measure is estimated to reduce projected state revenues by almost a billion dollars in 1978-79. The ongoing features of SB 3082 will reduce state revenues by about $600 million in 1979-80, and substantially higher amounts each year thereafter.

Revenues generated by the income tax more than doubled from 1973-74 to 1976-77. From 1966-67 to 1976-77 personal income tax collections increased almost sixfold from $627 million to $3.761 billion. Next to the growth in property taxes, it was the growth in personal income taxes that most anguished Californian taxpayers.

c. Bank and Corporation Tax - $2.3 billion. The bank and corporation tax was enacted in 1929 as a privilege tax levied on corporations doing business in California. General corporations currently pay a 9% rate on net income. Banks and other financial institutions pay an additional tax, not to exceed 4%, based on net income. The tax on bonds is in lieu of all state and local taxes except real property and motor vehicles. Bank and corporation taxes grew by only 2.6% in 1975-76 due to the effects of the recession but in the next two years had a truly astounding growth rate of 27% per year. When one takes into account that the bank and corporation tax rate is not graduated, the gain is even more remarkable and is further testimony to the phenomenal growth in California economy during this period. Economists project this growth pattern cannot continue.

d. Tax Growth. In order to compare the growth of these tax sources with the growth in Californian population and personal income, a five year period from 1973-1978 was selected. In that period the California population increased from 20.6 million to 22.3 million, a growth rate of 8%, an average growth of only 1.6%. Personal income, however, grew from $112.4 million to $197.4 million, a growth rate of 76% and an average of 15%.

General Fund revenue grew from $6.4 billion to $14 billion, an increase of 118% and an average increase of 24%. In that same period, taxes per capita were increasing from $306.91 to $622.55, an increase of 103% and an average of 20.5%. However, when one uses another, more meaningful, measure of tax incidence, General Fund taxes per $100 of personal income, the figures show a growth from $5.68 to $7.09 in the period observed, an increased of 25% and a more modest average increase of 5%.

While the rate of growth of personal income in the five year period was quite substantial, it was dramatically exceeded by General Fund tax revenue because of the progressivity of the income tax and the generally favorable business climate. Even when General Fund taxes are controlled for personal income growth, they still show a 5% per year average increase.

As noted above, state General Fund tax collections increased by 118% from 1973 to 1978. In that same period, revenue from sales and use taxes increased from $2.2 billion to $5 billion, an increase of 127%. Personal income taxes grew from $1.9 billion to $4.7 billion, an incredible increase of 147%. Bank and corporation taxes grew at least as dramatically, from $867,000 to $2 billion, a growth of 141%.

In sum, California's revenues during the 1973 to 1978 period grew at a phenomenal rate, reflecting the progressivity of California's income tax, the overall health of the California economy and the willingness of the California citizenry to go into debt as never before. None of the economic analyses of the state's economy predict the state can sustain such growth. Realistically, with the indexing provisions adopted in AB 3082, the growth rate in at least one major source, personal income tax, cannot keep pace with prior years.

2. Property Taxes The centerpiece of the Proposition 13 campaign was property taxation. California citizens were genuinely frightened by the high levels and the unprecedented growth. A California poll conducted during the summer of 1977, showed that 60% of the respondents felt property taxes were too high. Even opponents of Proposition 13 generally agreed that property taxes should be reduced. A recurrent image throughout the campaign was the proverbial little old lady being driven from her home by exorbitant property taxes which she could not pay because she lived on a fixed income. Although the number of people so affected was never verified and in fact was probably quite small, the successful imagery and the plausibility of the outcome was such that it was perceived by the voters as a not unrealistic possibility. In this section, a brief

description of the mechanics of California's per-Porposition 13 property tax system will serve as a base for an analysis of the prodigious increases in assessed value which drove property taxes higher and higher.

a. Pre-proposition 13 Property Tax System Prior to Proposition 13, the California property tax system operated in the following manner:

Assessments - All property was assessed at 25% of full value. Full value was based upon the assessor's estimate of the fair market value of the property. Because all property was not revalued each year, the actual assessments fell short of the prescribed 25% of fair market value.

Exemptions - The major exemptions included property owned by the government, cemeteries, hospitals, property used exclusively for religious, scientific, charitable or educational purposes, crops and household furnishings. Other properties given preferential treatment included open space land, historically significant property, nonprofit golf courses, property owned by veterans, owner occupied homes and a portion of business inventories.

Tax Rates - California tax rates were based on a specific dollar rate for each $100 of assessed value. Each level of local government: cities, counties, school districts and special districts (such as fire, mosquito abatement or a district established for another special purpose) was authorized to levy a property tax. The County Boards of Supervisors were responsible for collecting the taxes and distributing the revenues.

Tax Rate Limit - Cities, counties and special districts were limited to tax rates no higher than the rate in effect in one of two base years 1971-72 or 1972-73. School districts were treated differently. Instead of a tax rate limitation they operated under a revenue limitation. The tax rate limit on cities, counties and special districts proved to be of little impact in reducing local government expenditures because in most cases the rapid assessed value growth permitted substantial increases in expenditures.

As an example of how the California property tax system worked prior to Proposition 13, consider the following case: A homeowner living in his $80,000 home in a county with a tax rate of $10 per $100 of assessed valuation (about the state average prior to Proposition 13). The house is assessed at 25% of market value or $20,000. Under California law $1,750 of the assessed value of a homeowner's hime is exempted from property taxation so the $10 tax rate per $100 of assessed value when applied to $18,250 would produce a tax of $1,825.

b. Property Tax Growth California's property taxes were about 40% greater than the national average in 1976 and the state ranked fourth nationally in taxes per $1,000 of income ($64.90).[6] There are several factors which contributed to California's position but three are particularly important:

Assessment Practices: In 1967, the Legislature passed the Petris-Knox bill (AB 80) which altered California's assessment practices. What was seen as a strong reform law in the late 1960s, actually proved to be a major cause leading to the passage of Propostion 13 over a decade later.

In 1965, the two principal San Francisco papers (Chronical and Examiner) began competing series on assessment practices within San Francisco. Included among the findings were cases where locally elected assessors received campaign contributions conditioned upon a lowered assessed valuation on the contributor's business property. The public, and then the Legislature, became incensed and AB 80 was passed. It called for a uniform statewide ratio between a property's assessed value and its market value. In addition, provision was made for sufficient reassessment to keep the ratio constant. Local assessors were given three years to reassess all property to 25% of market value with provisions for reassessments on a periodic basis to keep the ratio constant. The State Board of Equalization was to monitor the local assessment practices.

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[6] Source: Governmental Finances, 1976-77

The AB 80 reform was based on the notion that business paid less than its fair share of the property taxes. In point of fact, business paid relatively more. San Francisco's single family homes were assessed at only 9% of market value while business property was taxed at 35% of market value.[7]

San Francisco was the most dramatic case of assessment differential but the principal generally held statewide. By requiring a uniform tax ratio for all property, the Legislature actually shifted a substantial portion of the property tax burden from the business/commercial community to homeowners. Because the turnover of business/commercial property occurs on a much less frequent basis than the turnover of homes, the market value for business property was less frequently established than for homes, leading to a further shifting of the incidence of property taxes to the homeowner. This shift to the homeowner of property tax incidence became increasingly noticeable in the seventies and created added anti-property tax pressures. Thus, it was a "reform" bill that served as one of the major stimulants to Proposition 13.

Assessed Value Growth: General inflation and the incredible growth in the value of single family residences led, over the past decade, to significant increases in assessed values, far outstripping the increases in the Consumer Price Index and population. Annual percentage increases in assessed values have ranged from a low of 5.3% in 1968-69 to a high of 14.4% in the 1977-78 fiscal year. The average annual growth rate over the ten year period was 8.8%. However, within the last four years the average annual rate has increased by an average of 12.4%. The Legislative Analyst[8] reports that at this rate, compounded, assessed value in the state would double every six years. Because properties are not assessed annually, it should be noted that an individual taxpayer might find his assessed value in any given year growing by an amount significantly greater than the county or statewide average. Assessed value changes in excess of 100%, while uncommon, were not unheard of.

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[7] See Diane B. Paul's The Politics of the Property Tax, Lexington, Massachusetts, D.C. Heath & Co., 1975

[8] California's Legislative Analyst is the Legislature's answer to the Governor's Department of Finance. The office is responsible directly to the Legislature and advises on fiscal matters, particularly those relating to the Governor's budget.

Tax Rate Changes: The final element in the tax revenue picture is the tax rate, which grew at a rapid rate for the first half of the last decade but levelled off and actually declined slightly in the second half.[9]

The major cause for the relative slow growth in tax rates stems from the statewide funding formula for schools which caused dramatic decreases in property tax rates and the rapid assessed value growth which gave other agencies of local government sufficient operating revenues without requiring the tax rate increases. Most local agencies, in fact, did not even levy the rates authorized by statute.

Table I

Growth of Assessed Values and Tax Rates
1967-68 Through 1978-79

	Taxable Assessed Values		Statewide Average Tax Rate	
Fiscal Year	Amount (Millions)	Percentage Growth	Rate Per $100 of AV	Percentage Change
1967-68	$ 46,187	--	$ 8.90	--
1968-69	48,627	5.3	9.30	4.5
1969-70	52,115	7.2	9.92	6.7
1970-71	55,580	6.7	10.85	9.4
1971-72	58,785	5.8	11.43	5.4
1972-73	62,791	6.8	11.46	0.3
1973-74	67,278	7.2	11.15	-2.7
1974-75	74,299	10.4	11.24	0.8
1975-76	82,689	11.3	11.33	0.8
1976-77	93,717	13.3	11.19	-1.2
1977-78	106,694	14.4	10.68	-4.6

Source: Legislative Analyst

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[9] See Table I.

Due to the combined effect of the above three factors, total local property tax revenues grew from about $4.1 billion in 1967-68 to an estimated $11.9 billion in 1977-78.[10] Per capita property taxes have more than doubled from $214 per person in 1967-68 to $525 in 1977-78. However, because of the growth of California personal income, the ratio of property taxes per $100 of personal income has grown by 13% over the decade, a more modest increase. This represents an almost threefold growth, an average growth rate of almost 16%.

The relatively slow growth of property taxes per $100 of personal income was more than offset by the visibility of the property tax and the dramatic shift of the overall tax burden to the homeowner. In the 1973-1977 period, housing prices in the major metropolitan areas of the state were increasing at about 15% per year. It should be emphasized that in a typical county, reassessments take place every two or three years, so than an individual homeowner in a major metropolitan area during this period might see his assessment jump by 30% or 45% every assessment period. Given the size and nature of these increases, it is not difficult to understand the underlying unrest among the property taxpayers of the state.

3. Comparisons with other States By any index, California is a high taxing state. In terms of general tax revenue for each $1,000 of personal income in 1976-77 California ranked third, exceeded only by Alaska and New York.[11] In terms of property taxes, in 1976-77 California ranked fourth. For each $1,000 of personal income Californians paid out $65.14 for property taxes, exceeded only by Alaska, Massachusetts and New Hampshire. In similar comparisons for 1977, California ranked fifteenth and sixteenth respectively in terms of income tax and individual income taxes. Given the spectacular

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[10] Part of the $11.4 billion (about $1.2 billion) is never actually paid by property owners because of state property tax relief subventions to local government.

[11] U.S. Bureau of the Census, Governmental Finances, 1976-77.

growth of the California economy, figures for 1978 will show California even higher in the rankings.

Perhaps even more importantly, in terms of the tax revolt movement California was rated third in the Advisory Commission on Intergovernmental Relations study, Measuring the Fiscal Blood Pressure of the States 1964-75.[12] California trailed only New York and Massachusetts in the "high and rising" category determined by a two dimensional measure displaying a state's current position relative to the median state and the state's tax growth since the base year, 1964. It is especially significant to note that California not only ranked high in absolute terms, but its rate of growth was also among the highest.

To add flame to the property tax revolt fire, California ranked 42nd among the 50 states in terms of reliance on state sources as a percentage of total state-local revenues.

By the latter half of the 1970s, California was well established as a taxation leader among the states. Both its state and local taxes were high relative to other states and its taxation growth rate was little short of phenomenal. Although the general public was probably not aware of California's relative ranking among the states, it was becoming more urgently interested in what was perceived as runaway taxation. The citizens in most other states would have had to either generate more heat on their legislators or wait until the next election to "throw the rascals out". But in California, a more convenient and expeditious alternative existed: the initiative.

B. Earlier Initiatives

Section 8 of Article II of the California Constitution, sets forth the constitutional guarantee for the initiative process. California has the most liberal initiative process in the United States. An initiative statute may be placed on the ballot by a petition signed by electors equal to five percent of the total number of voters who voted for Governor in the last election. A constitutional amendment such as Proposition 13 requires signatures equaling eight percent. The initiative process dates from the early years of the 20th century when California's most noted Governor, Hiram Johnson, wrested control of the state from the Southern Pacific railroad.

California has had a long and stormy history of utilization of the initiative process. Issues varying from housing, busing and the death penalty have shared positions on the ballot with pornography, coastline control and smoking. Although most measures introduced through the initiative process do not receive final voter approval, it is a fairly simple matter, if one has the money and/or the manpower, to qualify a propostion for the ballot. There are firms which specialize in getting initiatives on the ballot for a specified fee per signature.

Proposition 13 was not the first tax or expenditure control measure on the ballot in California. In fact, the last decade alone witnessed three such efforts, all of them unsuccessful, but definitely precursors to the success of Proposition 13.

1. The Watson Initiative - 1968 The Watson Initiative could trace its lineage directly to the Petris/Knox bill. The resulting shift in tax burden caused large increases in the average homeowner's property tax. Phillip Watson, the County Assessor of Los Angeles, instigated the Initiative, which qualified as Proposition 9 on the November 1968 ballot. The proposal called for the division of property tax revenues into two categories - one for "people related services" (such as education and welfare) and the other for "property related services" (the remaining local government functions). "People related services" were to be phased off dependence on the property tax, while for the purposes of remaining "property related services", the tax would be limited to 1% of current market value.[12]

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[12] In 1968, the average tax bill equalled about 2-1/2% of market value.

To counteract the Watson Initiative, the Legislature also placed a constitutional amendment on the 1968 ballot. It was a very simple homeowner's exemption, allowing the first $750 of an owner occupied home to be exempted from property tax. It also exempted the first 15% of the value of business inventories and authorized the Legislature by subsequent action to increase the homeowner's exemption to $1,750 and the business inventory exemption to 50%.

The ensuing campaign pictured the Watson Initiative as irresponsible (cutting education and welfare) with a high probability of sales and insurance tax increases. The legislatively sponsored homeowner's exemption was portrayed as "responsible" with more certain results. Levy and Zamolo[13] in their excellent analysis of Proposition 13, maintain that the general economic climate in California was good and the level of satisfaction toward the cost of public services was still relatively high in 1968 and this, more than any other factor, determined the outcome of the election. The legislatively sponsored homeowner's exemption was approved by 54% of the voters and the Watson Initiative went down to an overwhelming 2-1 defeat.

2. The Watson Initiative - 1972 Watson II was similar in general outline to its predecessor with two important differences. First, it specified the sources of replacement revenue (sales tax, liquor tax, cigarette tax and corporate income tax) for the reduction in the income tax. Second, it established a uniform educational expenditure with a fixed state-local total of $850 per A.D.A. The alcohol and tobacco industries joined forces with a set of unusual colleagues, the educational establishment, to oppose the Initiative vigorously. Governor Ronald Reagan and the Legislature, fearing a substantial revenue shortfall from the measure, also joined in active opposition.

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[13] Frank Levy and Paul Zamolo, "The Preconditions of Proposition 13", Working Paper 1105-01, October 1978, Department of Housing and Urban Development.

Despite a declining economic climate and continued acceleration of assessed values, the second Watson Initiative fared only slightly better than Watson I, getting only 34% of the vote.

In the meantime, the Legislature was embroiled in an extended battle to provide property tax relief, Serrano compliance and controls on local government expenditures. The two most powerful politicians in the state, the Republican Governor Ronald Reagan and the Democratic Assembly Speaker Robert Moretti, joined forces to endorse Senate Bill 90 which had as its major provisions:

1. The imposition of an additional one cent on the sales tax;
2. Revenue limits placed on schools and wealth equalization features designed to comply with Serrano;
3. Tax rate limits placed on cities, counties and special districts;
4. An increase in the homeowner's exemption and the business inventory tax to the maximum provided in the Constitution;
5. A tax credit for renters.

After a long holdout by the more liberal Democrats in the Senate who objected to the sales tax increase and who viewed the Serrano features to be inadequate, the bill was finally passed, partly as a result of pressure from the educational lobby who were desperate for additional funds. The Legislature had once again delivered a more moderate, if slightly belated response to the increasing voter demands for property tax relief. It is also important to note that by 1972 the issue had shifted beyond more property tax relief and had begun to encompass expenditure limitations.

3. Proposition I - 1973 Governor Ronald Reagan, dissatisfied with the government expenditure limitations imposed by SB 90, attempted, by the initiative process and by calling a special election, to lend the imprimatur of his office to a measure which would have tightened the expenditure limitations on local government and would have required a two-thirds vote, instead of a simple majority to increase taxes. More importantly, the

measure featured a limitation on state expenditures. The limit was established as the growth in personal income statewide.

Given what we have recently experienced in personal income growth rates, the limitation now seems relatively generous. However, in 1973 it was viewed, especially by the Legislature, as overly restrictive on the state's capability to expend funds. Public sector employees joined forces with the Legislature and other Reagan political foes in the campaign against Proposition I. The complexity of the Proposition and the relative newness of the concept for the average voter, plus the resistance on the part of many voters who saw it as a political move on Reagan's part to establish a national campaign platform plank, helped to bring about its defeat. However, the margin of defeat was significantly less than for the two prior statewide propositions, perhaps indicating that the voters were feeling a little more antagonism toward the public sector. Proposition I failed, but received a 44 percent affirmative vote.

It is important to note that during this period, in response to the initiative challenges, the Legislature answered with simpler, more "responsible", less drastic, alternatives. First came the constitutional amendment authorizing the homeowner's exemption, and then SB 90. However, in spite of the legislative response, the public attitude began to shift and in the Proposition I campaign a definite swing to the anti-government theme can be noted. The comparatively narrow defeat of Proposition I should have served as a warning for the movement to come, and the increasing disenchantment with government by the voters.

C. Disenchantment with Government

The decade just prior to Proposition 13 saw a growth rate in state and local governmental expenditures which far outstripped inflation and population growth within the state. This growth in expendiutres was not perceived as producing an equivalend increase in the quality or quantity of governmental services and when this factor was coupled with an increasingly evident mistrust of public servants, it added an anti-government component to the anti-tax theme mentioned earlier.

1. Growth in Expenditures a) State: In the decade from 1967-68, state General fund expendiutres grew from $3.3 billion in 1967-68 to $11.9 billion 1977-78, an average growth rate of 13.9%. The growth rates ranged from 3.6% in Reagan's first year of his second term, to a high of 30% in 1973-74, the first year of implementation of SB 90. Over that same period the population grew at an average rate of 1.5% and the Consumer Price Index grew at about 6.3% per year. A better indicator of government sector costs, the state and local government price deflator, grew at an average 7.4%.[14] In the meantime, as mentioned earlier, personal income grew at an average rate of 9.8%.

b) Local: From 1967-68 to 1976-77, the growth in local expenditures was spectacular. County General Fund expenditures, excluding debt service, increased from $2.75 billion to $7.15 billion an increase of 160%. The major categories of expenditure in city government grew over the same period of time from $1.27 billion to $3.44 billion, an equally impressive increase of almost 175%. School expenditures grew at about the same rate over the decade but had a distinctly different pattern based upon the school finance law in effect at the time. The period of 1967-68 through 1971-72 was a period of low to moderate growth, with the schools getting little increase in state support and modest increases based upon property tax growth. After SB 90, the schools received double digit inflation adjustment growth for three years and then settled into a growth pattern from 1974-1977 roughly equivalent to the growth in county expenditures. From 1972-73 and an expenditure total of $6.02 billion, schools in K-12 by 1978-79, were expending $9.48 billion, an average growth rate of about 5.1% per year.

It is significant to note that SB 90 moved school districts off a tax rate limit based formula and placed schools under revenue limit controls.[15] Had schools been able to receive the benefits of the fantastic assessed value increases in the period after SB 90, the property tax increases cited earlier would have been much higher.

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[14] Office of Legislative Analyst, Analysis of the Budget Bill, Various years.

[15] Under revenue limits, if school revenues exceed the limit, the property tax rate is automatically adjusted downward.

2. Public Attitude Probably more important than the actual dollar expenditure growth were the increasingly skeptical public views of public service. Public skepticism was often highest about those services which enjoyed major growth during the last decade, namely health, welfare and public employee benefits.

Several factors aided in the erosion of public confidence in public services:

a. The growth in major welfare programs - over 200% in the decade, publicity concerning growing welfare fraud, and the frequently held perception that there was no incentive for welfare beneficiaries to "get off the dole".

b. The growth in major health programs and the continuing allegations about governmental inefficiency in administering the program, and allegations of political pay-offs to and from health care providers.

c. The growing antipathy toward the public schools generated by growing mistrust of the schools of the 60s, the declining student achievement scores, growing teacher militancy, forced busing, the advent of collective bargaining and the general perception that school districts are top-heavy administratively, all can be added to the fact that school costs were escalating at a time of declining enrollment.

d. The growing problems associated with public employee retirement systems which often are woefully underfunded. This, plus the perception of excessive protection through tenure of civil service and perception of "excessive" benefits (dental, vacation, pensions etc.) added to the public's concern.

e. The Watergate mentality, which had tremendous carryover effect to all political figures and which led to a general mistrust of politicians; neither state nor local political figures were able to escape the tarnish of Watergate.

Growing public sector costs, plus growing mistrust and apprehension about the quality of public services and servants when added to general anti-politician attitudes fostered by Watergate, created a not-so-strange anti-government bedfellow for the anti tax advocates.

In the past, the Legislature had always been able to rise to the occasion and forestall any challenges brought through the initiative process, no matter who the bedfellows. Many observers felt they would do so again. They were wrong.

D. Legislative Inability to Enact Reform

The 1977 legislative session opened with the enactment of a major tax relief bill as the top priority for most legislators. In fact, the enthusiasm was so great that the Senate passed three such measures, one - generally described as the Governor's Tax Reform Bill, a second - supported by the liberal Democrats of the Senate, and a third - a personal income tax relief bill which featured an indexing of the brackets by an inflation factor.[16]

1. Key Questions The two competitors to the liberal Democratic bill were killed in the Assembly and that measure, Senate Bill 154, became the vehicle for potential reform. When the Senate refused to concur in Assembly amendments, the bill was sent to a six member, two house conference committee charged with the responsiblity of approving a bill which could achieve the required 2/3 vote in each house. The conferees faced the same problems that had plagued their predecessors and would plague their successors. Essentially, the problems can be characterized as "How much?" and "To whom?".

The year, 1977, saw enactment of Assembly Bill 65, the most expensive and most comprehensive school finance bill ever enacted in California. There was a constant jockeying for position between the pro-education and pro-tax relief forces. Each was played off against the other by the Governor and the Department of Finance who were concerned that an overly generous Legislature would pass legislation which would ultimately lead to a tax increase. The fact that Calfiornia was attempting to enact a major school finnance bill designed to comply with Serrano and increase general funding levels for a variety of educational programs in the same year that tax reform legislation was being sought, created a dilemma among the policy makers that was difficult to solve. Coupled with the continued underestimates of the size of the state surplus, members of both houses argued whether the proposed tax relief would be enough to forestall a possible initiative effort.

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[16] The California income tax is highly progressive. As inflation pushes salaries upward, the individual taxpayer finds himself automatically thrust into a higher bracket. The income generated from this phenomenon approaches $1 billion annually.

The other major issue was to whom the relief should be directed. Should relief be focussed on those who had paid the most, or should it become a vehicle for income redistribution? Generally speaking, the Senate favored the former course, the Assembly the latter. When SB 154 emerged from the joint conference comittee with the "circuit breaker" concept[17] still intact, its passage in the Assembly was assured as was its defeat in the Senate. A second conference committee achieved the same result and the Legislature was forced to adjourn in September without enacting a tax relief measure. The political problem generated by the "circuit breaker" as contained in SB 154, was simply that not enough people got enough relief. Some 33% of the homeowners would have received no relief and 50% of the homeowners would have received $65 or less. In retrospect, had the Legislature known the size of the impending surplus, the ante could have been upped substantially - probably by enough to insure passsage. At this point, neither the Legislature nor the Governor was willing to guess wrong and face the prospects of a potential tax increase.

2. Senate Bill 1 and Proposition 8 It is interesting to note that unlike the two Watson Initiatives discussed earlier, the Legislature was unable to agree upon a substantial

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[17] The circuit breaker is a tax relief provision which uses income as one of the variables to determine the amount of relief. Relief is inversely proportional to income, i.e., in the case of two individuals paying the same tax, the one with the lower income would receive more relief.

property tax relief package to pose as a counter to the forthcoming initiative assault. The optimist among the legislators argued that there was still time and an early 1978 enactment could still reach the ballot by June of that year. But once again the Legislature became embroiled in the issues that had stymied action the year before. The Governor did not help matters when he called a special session - several observers felt it made it more difficult to achieve concensus. Bills with no income redistributional effects tended to get bogged down in the liberally dominated Senate Revenue and Taxation Committee while those containing the "circuit breaker" could not pass the more conservative Senate Finance Committee. By this time a mild panic had begun to set in. The Jarvis-Gann Initiative had qualified for the ballot and the tax relief promised by that measure looked truly gargantuan. Again the Legislature was hampered by the overly conservative nature of the surplus estimates. Had the size of the potential surplus been known, a more attractive ballot proposition might have gained relatively quick approval. Finally, after weeks of jockeying for position between members of both houses and advocates for each of the distributional formulas, a joint conference committee approved Senate Bill 1 which successfully passed both houses on March 3, 1978. Its implementation was conditioned upon the passage of its companion SCA 6 (which became Proposition 8) on the ballot and the defeat of Proposition 13. SB 1 consisted of five major and separable programs. Each dealt with a different aspect of the property tax problem faced by California taxpayers:

a. SB 1 would have imposed limitations on property tax revenue growth of cities, counties and special districts. SB 1 would have allowed revenues to grow based on increases in the GNP index for the cost of local government services. In those areas of rapidly increasing assessments, SB 1 would have forced reductions in property tax rates. The higher the reassessment, the greater the reduction in tax rates. By utilizing a "differential tax rate" as authorized by Proposition 8, SB 1 recognized the historical trend for owner occupied property values to increase at a rate much higher than other property. By applying the same local revenue limits to both sides of the split roll, i.e. owner occupief property/all other property, SB 1 would have allowed greater property tax reductions for homeowners than for owners of all other property. Both groups of property would have benefited by reduced growth in property taxes under the local revenue limit. The tax savings from these limits would have grown over time. It was estimated that by 1981-82 $1.5 billion in potentially increased property taxes would have been saved by these limits.

b. SB 1 would have provided at least a 30% cut in homeowner property taxes beginning in 1978-79. This reduction was in addition to the current homeowner's exemption. This cut would have been accomplished by state assumption of the homeowner's share of major county health and welfare costs, and cut in tax rates so that the total tax rate reduction including the reduction attributable to welfare, would have been 30%.

c. SB 1 would have targeted special, additional relief to lower income senior citizen homeowners and renters, by adding extra benefits into the Senior Citizens' Property Tax Assistance Program, and opening the program to new recipients.

d. SB 1 would have doubled the existing income tax credit for renters from $37 to $75 and would have extended the credit to public assistance recipients for the first time.

e. SB 1 would have imposed revenue limits on the state. All revenues in excess of personal income growth adjusted by a 1.2 elasticity factor would have accrued to an Excess Revenue Fund. Such funds would have been specifically designated for future taxpayer relief and other limited uses.

The California Constitution, Article XIII, requires both uniform assessments and uniform tax rates for all classes of real property. Proposition 8 would have changed that provision. Proposition 8 would have authorized a split rate to permit a lower tax rate for owner-occupied dwellings than all other property. It would have expressly protected commercial taxpayers from a shift that would finance homeowner's relief. Uniform assessments, based on fair market value, would have continued to be required under current law. Propostion 8 would have permitted the dual revenue limits contained in SB 1. These limits would have required reductions in tax rates for all property when assessed value increases exceed the growth in the revenue limit.

The provisions of SB 1 and Proposition 8, if approved by the voters, would have provided only $1.4 billion first year tax relief as compared to the $7 billion promised by Jarvis. The question most frequently asked in the legislative cooridors was "Is it enough?".

The Legislature had finally responded to the challenge of Jarvis-Gann just days prior to the deadline for getting measures on the statewide ballot. Unfortunitely, the size of relief and the complexity of the package caused one long time legislative observer to note that the measure was simply "too little, too late and too hard to understand."

Some have opined that a similar measure enacted a year earlier would have been enough to forestall the Jarvis-Gann Initiative. However, most observers are of the opinion that it was so complex and looked like such a small amount of relief when compared with the Jarvis-Gann proposal that even an earlier start would not have been enough. They argue that the basic flaw with the legislative response was that it was simply "not enough" and the reason it was comparatively small can be directly attributed to the projections about the size of the state surplus.

E. Surplus

Before discussing the changing size of the California surplus, it may be helpful to discuss briefly the process by which the Department of Finance makes estimates about the state's revenues and expenditures.

Within the Department there is a unit responsible for forecasting the state of the

California economy for the next fiscal year. The difficulty of projecting the economic future for a state as large and complex as the State of California should be obvious. It is this projection which forms the heart of the Governor's annual budget.

One of the contributing problems to the understimation of the size of the annual surplus has been the natural proclivities of the Department of Finance to make "safe" estimates. The reason for the conservatism is the understandable tendency to protect against overly optimistic projections which might lead to expenditures in excess of revenues. This phenomenon, over time, inexorably results in the forecaster's nightmare - the necessity for calling for a tax increase. Even given the inclination towards caution, there is another, much more powerful explanation for the size of the surplus - the absolutely unparalelled economic growth in the California economy since 1973-74, especially in the two fiscal years preceding the passage of Propostion 13. For 1977, the Department of Finance underestimated the state's economic performance in such areas as personal income, corporate profits, taxable sales, employment, building permits and new car sales (the largest increase in history - 24.9%). Again in 1978, the Department underestimated the state's economic performance in a number of dimensions: personal income (strongest gain in 27 years) employment, taxable sales and corporate profits. In fairness to the Department's prognostications, no other economic forecaster did much better and several were further off the mark.

The economic forecasts cited above are a part of the Governor's Budget when introduced. These estimates are then recalculated using more recent data and some time in May are amended and become the base for another unit within the Department of Finance to use for making revenue projections. Obviously, if the base portrays an unrealistically conservative estimate of the economy, the ensuing revenue estimates will be seriously understated. In just one year, 1977-78, General Fund revenues were underestimated by $1.3 billion, using January 1977 as the basis for projection. Even the May revised estimate was $1 billion short of the actual revenue. This latter figure is especially significant because it is the last estimate the Legislature gets prior to enactment of the budget.

At the same time that the revenue projections are being made, the Department of Finance is also updating its January expenditure estimates for its May report to the Legislature. Just as it is natural for financial prognosticators to underestimate revenues, so it is natural to overestimate expenditures and for the same reason - to avoid a potential tax increase.

Table 2 reflects the growth in the state's surplus since 1973-74. The year end surplus in 1973-74 was $180.1 million. It grew continuously through 1977-78, reaching $3,686.1 million on June 30, 1978. It is important to note that changes in the year end surplus occurred in 1977-78 and totalled $1.9 billion. (Caused by budget cuts generated as a response to Proposition 13.)[18]

Table 2

General Fund Surplus, 1973-74 through 1977-78
(in millions)

	1973-74	1974-75	1975-76	1976-1977	1977-78
Prior Year Reserves (adjusted)	$ 688.5	$ 383.0	$ 696.1	$ 904.6	$ 1,877.5
Revenues and Transfers	6,965.0	8,617.3	9,612.8	11,380.6	13,695.0
Net Expenditures	$7,408.8	$8,267.4	$9,471.7	$10,495.1	$11,781.4
(Annual Surplus or Deficit)	(-443.8)	(+349.9)	(+141.1)	(+885.5)	(+1,913.6)
Carry-Over Reserves (-)	178.2	105.4	77.0	105.0	200.8
Year-End Surplus	$ 180.1	$ 554.7	$ 731.8	$ 1,712.1	$ 3,686.1

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[18] The size of the surplus displayed fails to capture its true magnitude until one realizes that in the period 1977-78 and 1978-79 the Legislature passed: a $4.2 billion local government bail out in response to Proposition 13 (it is assumed that about the same amount will be made available in 1979-80); the largest school finance bill in its history with annual costs approaching $1 billion; and the largest tax relief bill in the state's history, again totalling almost $1 billion the first year.

The size and continuing changes in the surplus estimates were to create confusion and embarrassment to the Legislature and the Governor in the subsequent Proposition 13 campaign. The credibility of the politicians in Sacramento was seriously eroded by the consistent overstatement of the state's problem in dealing with Proposition 13. Both the Governor and his Department of Finance were under attack by other state officials, most prominently the Controller of the state and the State Treasurer, for their errors in estimation. The Governor helped bring about the high visibility of the surplus. Brown thought it enhanced his national stature to be able to point to his record of frugality and he used the surplus as a measure of his fiscal skills and conservative spending record. Although there is some evidence that Brown didn't reveal all he knew about the size of the surplus and although, like other fiscal analysts, the Department of Finance portrayed a conservative bias, the big problem in forecasting the surplus occurred because of the unprecedented and unpredictable growth in state revenues which apparently exceeded the expectations of everybody, except Howard Jarvis.

F. Summary

Although property taxes provided the focus behind the "revolt", it is evident that other factors contributed significantly to the Jarvis-Gann effort. While the incidence of the property tax was shifting more and more to homeowners, their other taxes were growing at record rates. Revenue from the sales tax had doubled in five years and income tax revenue had multiplied by six times in the last decade. California, in comparison with other states, was a high-taxing state and was growing even more so.

In spite of the growing evidence of the tax revolt, the Legislature did not respond as they had earlier in similar situations and failed to provide the necessary relief. In many other states there are no alternatives to convincing or "turning out" a recalcitrant Legislature. In California that is not the case. Its citizens have a fairly simple and easy option - the initiative process. Although past efforts to reform and reduce taxes by this process were not successful, those efforts served as precursors to the success that was to follow.

Stung by legislative unresponsiveness and the decreasing credibility of politicians in general (epitomized by the increasing distrust generated by the inaccurate surplus projections) the California citizenry were ripe for a "grass-roots" change effort. Howard Jarvis and Paul Gann provided the vehicle.

III. The Jarvis Gann Initiative

The failure of the California Legislature to enact a meaningful property tax reform measure in 1977 lent impetus to the efforts of Howard Jarvis and Paul Gann to put their own initiative on the ballot. Both had unsuccessfully sought to qualify initiatives before (Jarvis had failed three earlier times). But this was to be different.

Jarvis, an official of the Apartment Association of Los Angeles, Director of the United Organization of Taxpayers, and a long time foe of the property tax, concentrated his efforts to gain signatures in Southern California. The northern California effort was headed by the less bombastic, but no less persistent, Paul Gann, the self-proclaimed leader of "People's Advocates", a group dedicated to reducing the size of government. It was this interesting combination of the ebullient Mr. Jarvis and the restrained Mr. Gann that brought together in one package an anti-tax, anti-government message which was to deliver an unprecedented political victory.

Using very little money, but depending on a strong community based organization, the Jarvis-Gann Initiative qualified with a record 1.2 million signatures, almost three times the number required. By December 1977, the Initiative, which was to become Proposition 13, had qualified for inclusion on the June 1978 ballot.

The campaing that followed was one of the most interesting and volatile in the history of the state. Jarvis and Gann relied most heavily on local citizens groups who were upset by high taxes and "wasteful" government. Campaign support also came from apartment house owners and other real estate groups but it was the broad and locally based, deeply concerned taxpayer groups which formed the heart of the organization.[1] Jarvis and Gann successfully emphasized the role of the local groups by encouraging them to form and organize their own local campaigns. A significant portion of the campaign's success can be attribu'ed to the pervasive utilization of radio talk shows. In San Francisco and Los Angeles one could hardly turn the radio dial without hearing the vocie of a Proposition 13 proponent. The talk show had the added advantage of being a "no-cost" campaign weapon. Jarvis and Gann were assisted by the campaign firm of Butcher and Forde. Although this organization had little radio and television experience, its campaign efforts were effective. The three campaign themes were entirely predictable: anti-tax, anti-government expenditure, and anti-politician. The "Yes on 13" campaign rhetoric included such statements as "send a message to those popcorn balls in Sacramento", "cut the fat", "cut property taxes by two-thirds", and "show the politicians who's boss".

The "No on 13" campaign was almost totally different. It was late getting started - a viable coalition was not formed until February or March of 1978. The coalition, primarily composed of labor, business, education, good government groups, public employees and various politicians, was brought together through the leadership of the California Assembly Speaker, Leo McCarthy and a California Teacher Association official, Cal Rossi.[2] One of the first actions of the coalition was to hire a highly successful and highly sought after campaign firm, Winner, Wagner and Associates.[3] Winner-Wagner had been spectacularly successful in defeating anti-nuclear initiatives in three states, including California, and in campaigning successfully for a parks and beaches bond issue in 1976. In addition, their record of campaign successes for political candidates was equally impressive. However, several decisions made by the firm were to be criticized later by the Proposition's opponents. First, Winner-Wagner insisted on a highly centralized, tightly controlled campaign, including the centralized development of campaign materials and TV spots. Many of the potential local supporters were put off by the lack of local involvement in the strategy and implementation. Winner-Wagner had additional problems. By the time the opponents had organized an anti-Proposition 13 coalition, had hired Winner-Wagner and had begun to solicit funds, it was getting perilously late to buy the critical TV and other media time which is so vital to any California political campaign. Other critics point out that the Winner-Wagner response was tepid when compared with the Jarvis campaign and that not enough emphasis was placed on the potential anti-education, pro-business impact of Proposition 13. Perhaps the major difficulty the firm had was in deciding which one of the three themes stressed by Jarvis to attack. The dominant messages of the opposition were that the passage of 13 would result in increased sales and income taxes or drastic cuts in service or both and that Proposition 13 contained no guaranteed renter relief.

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[1] The list of statewide organizations in favor included the Farm Bureau, the United Organization of Taxpayers and People's Advocates.

[2] The list of statewide organizations opposed included the California Taxpayers Association, California Tax Reform Association, California Fire Services Coalition, State Board of Education, California Labor Federation AFL-CIO, League of Women Voters, California Teachers Association, Common Cause, League of California Cities, California Supervisors Association, California State Employees Association, Sierra Club.

Part of the opposition strategy was to discredit Proposition 13 as irrational and irresponsible. The Proposition 13 advocates countered with television advertisements featuring Nobel Prize economist, Milton Friedman. Winner-Wagner countered with their own economist, Walter Heller, a move which displayed the reactive mode of the anti-13 forces.

As if the battle was not sufficiently difficult, the proponents were able to raise

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[3] Jarvis-Gann even tried to gain their services -- they refused.

$2.5 million compared with the $1.6 million raised by the opponents.

Throughout the campaign, the size of the state surplus was to be a source of continued embarrassment for the anti-13 coalition members. Just as they made their point that Proposition 13 would inevitably result in a major income or sales tax increase or a drastic cut in public services, another estimate would be released from the Department of Finance showing additional hundreds of millions of dollars available from the surplus. Jarvis was particularly successful in arguing that the important services, fire, police and education, would not be forced to undergo the kinds of cuts portrayed by the opposition, because the surplus was more than sufficient to avoid the problems.

In February of 1978, the public was asked its reaction to Proposition 13 by the Field Institute, a noted California based public opinion organization. About 56% stated they were aware of Proposition 13, but only 30% were willing to take a position. This latter group divided 20% for, 10% opposed. Although early results showed a two to one margin for the proponents, the opposition took heart at the large number of undecided and unaware voters. Field's experts stated that given the relatively low level of commitment at this point, strong legislative action prior to June 6 could have a great effect on the final decision. About six weeks later, Field published his second assessment of public support for Proposition 13. His findings caused guarded optimism in the camp of opponents. Field found that those who now claimed knowledge of Proposition 13 had climbed from 56% to 70%. 52% of the total sampled stated they now had an opinion and and of these, the supporters barely edged the opponents 27% to 25%, a marked contrast to the February results. The passage by the Legislature of a competing ballot measure (Proposition 8) was seen as an aid in eroding some of the support for 13. However, Field's survey closed on an ominous note, "...the proponent arguments, in general, promote more intensely positive feelings than do the arguments of the opponents." In May, the next round of Field results portrayed a still split public attitude with the supporters at 42% and opponents at 39%. One of Proposition 13's major advocates, Assembly minority leader Paul Priolo, was quoted in the Los Angeles Times as stating, "It doesn't look all that good for passage of Proposition 13. I'd say it's nip and tuck at this point."

Two actions in May by the Los Angeles County Assessor turned what might have been a close election into a rout. The Assessor, Alexander Pope, in an unprecedented action and under pressure from the Los Angeles County Board of Supervisors, made public residential reassessment notices in advance of their actual mailing, which would normally not have occurred until July. The results were devastating. About one third of the homeowners in Los Angeles County were reassessed in 1978 and the resulting reassessments, many increasing by 100%, and the largest in 30 years, triggered an angry taxpayers' storm of protest. Pope then dropped bombshell number two by proposing the 1978 reassessments be frozen at 1975 levels (an illegal policy). This action caused a negative reaction by the homeowners who had been reassessed in the prior two years. Pope had, by his early announcement of assessments, angered about one third of the homeowners and by his second action, alienated the remaining two thirds, especially when it was discovered he had no power to enforce his latter promise. More than any single event, many observers alledge that the actions by Pope had guaranteed the outcome of the Proposition 13 elections.

The next Los Angeles Times poll on May 28, displayed the expected results. Now the ayes led the noes by 55% to 39% with only 6% undecided. The legislative alternative was viewed with ambivalence by the voters and led by 47% to 41%, down from the 51% to 30% figure reported in late April.

The Field Poll released June 3 confirmed the earlier Proposition 13 trends with 57% supporting and only 39% in opposition. It was clear by now that an overwhelming victory for Proposition 13 was all but inevitable. As if to underscore the victory, Governor Jerry Brown, who had been one of Proposition 13's most vigorous critics referring to it as a "rip-off" and "consumer fraud" and having accused Jarvis of "a kind of demagoguery", quit the campaign trail and began making plans for its implementation. The media too had captured the significance of the moment and the "California Taxpayer Revolt" became the heart of the news and interview programs nationally.

The June 6 election results were anticlimactic. Only three of California's 58 counties (San Francisco, Kern and Yolo) opposed the Proposition as it won an overwhelming 64.7% voter affirmation. Proposition 8, the legislative counterproposal, was defeated 53% to 47%, never having been understood by the voters.[4]

In retrospect and in spite of the continued criticism of the anti-Proposition 13 campaign, it seems that the decision to join the themes of anti-taxation with anti-government and anti-politicians was crucial factor for the campaign's success. It meant that at no time was there a single focus for the anti-Proposition 13 advocates and when this lack of focus was coupled with the actions of the Los Angeles assessor and even more importantly with the specter of the huge property tax increases which the assessor's notices promised, the results seemed preordained.

It should be emphasized that the campaign was merely one segment in the long running Proposition 13 saga. Had it not been for the tax growth, giant surplus, and lack of confidence in the political system and governance mechanisms, the campaign segment might not have taken place. Although the initiative has played an important role in California political history, only 26 of the 148 proposed initiatives between 1960 and 1978 have even gotten on the ballot and of these only seven have been successful.

The success of Proposition 13 was at least partially attributable to its relative simplicity. The Watson Initiatives mentioned earlier suffered from the fact that they were more complicated than the legislative alternatives. This was not to be the case for Proposition 13 which, although poorly drafted and filled with confusing provisions, looked like a Dick and Jane primer when compared with its legislatively generated counterpart, Proposition 8.

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[4] The statewide polls all portrayed a lack of understanding of Proposition 8's provisions. When the provisions were explained by the pollsters, those polled often expressed strong support.

A. Provisions of Propostion 13

Jarvis and Gann hit upon a deceptively simple but politically insightful solution to the major problem faced by its unseccessful predecessors in gaining passage of a tax-cutting initiative. They displayed only the tax mechanism and left it to others, in this case the Legislature and the Governor, to solve the complicated problems of deciding which government services to cut or which alternative revenue resources to increase. By so doing, they effectively blunted much of the potential opposition who were uncertain (and unable to articulate their concerns) about the impact of the Proposition on their particular programs.

The proponents of Proposition 13 could argue that no essential services would be cut. "Essential" remained largely undefined and varied from audience to audience, but generally included fire, police and education. High on the "non-essential" list were health and welfare. It is another of the ironies surrounding Proposition 13 that the "cuts" were left to the same Legislature and Governor who were so thoroughly excoriated for past irresponsible behavior. The essential provisions of Proposition 13 can be summarized briefly:

1. Limit Proposition 13 limits taxes on real property to 1% of the full cash value, plus such rates as are necessary to retire previously voter approved bonded indebtedness. Since property is assessed at 25% of full value and taxed at a dollar rate on each $100 of assessed value, the 1% of full market value translates to a $4 per $100 of assessed value tax rate.[5] In 1977, the average tax rate was $10.32 and represented an average of approximately 2.7% of market value. In addition to the $4 limit, a tax to repay previously voter approved bonded indebtedness is authorized. This adds approximately an additional $1 to the average tax rate.

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[5] Since the Proposition did not eliminate existing state property tax relief programs, and since tax relief is calculated after the 1% maximum is determined, the effective tax rate is actually less than 1%.

Proposition 13 does not permit local voters or the state Legislature to exceed the limit. The limit can be increased only by another constitutional amendment.

2. Roll-Back Proposition 13 rolls back the "full cash value" for property tax purposes to the 1975-76 valuation of real property. Properties assessed after 1975-76 must be rolled back to that level. Property which was newly constructed or sold after March 1975, would be assessed at its market value at the date of the construction or sale. Rolling assessments back to the 1975-76 level creates, in effect, a double reduction. Instead of a 1% limit the additional loss of statewide assessed value growth makes it closer to seven tenths of 1%.
3. Limited Assessed Value Increases Proposition 13 limits increases in full cash value to 2% per annum.[6] Property purchased, newly constructed, or on which ownership has changed, would be reassessed at the actual market price.
4. State Tax Increases Proposition 13 requires a two-thirds vote of both houses of the Legislature to increase existing taxes or levy new ones, instead of a simple majority. Since the California Constitution requires a two-thirds vote for all appropriation bills and since most tax increases include appropriation sections, the two-third requirement is not particularly onerous.
5. Local Tax Alternatives Proposition 13 requires a two-thirds vote of the voters of local agency taxes to impose or increase district taxes (other than property taxes). In most cases, authorization by the state Legislature also would be required before a local government could impose these taxes.

Although Proposition 13 was a picture of simplicity, its potential impact on local government revenue was devastating.

B Projected Impact On Revenues and Tax Burden

Proposition 13 is estimated to reduce the state's aggregate property tax revenue by approximately 57% or by approximately $7 billion in its first year of operation. The $7 billion loss in property tax revenue is partially offset by an estimated $640 million which represents the decrease in state subventions to local government for tax relief payments. Reduced property tax payments would automatically induce increases in the state income and business and corporation taxes because property taxes currently are deductible from both. However, if high unemployment results from the local agency revenue reductions, the state costs for unemployment, welfare and and medical care would soar. In addition, drops in state revenue could be drastic because of reductions in sales and income tax revenue.

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[6] The actual limit is the Consumer Price Index but not to exceed 2%. Because C.P.I. is projected to grow at a much faster rate, the 2% limit is, for all practical purposes, the real limit.

State officials were faced with a dilemma in explaining the projected impact of Proposition 13 on state revenues and tax burdens. One set of assumptions normally presumed there would be no tax increases to provide for any replacement revenues for local agencies of government. This proved to be a more realistic projection in the short run as it became clearer that the voters did not expect increases in other taxes to offset the loss in property tax income. Although the Department of Finance and the Legislative Analyst went through the motions of projecting tax burden and tax incidence changes brought about by increases in other state tax sources, most observers ignored these projections as being politically unrealistic.

More relevant were the estimates that related to how many dollars the state would redirect from existing revenue sources, including the state surplus, to "bail-out" local government.

There were two extreme sets of assumptions upon which these impact projections were based. The first case was made that the state would replace none of the local agencies' lost revenue and the second that the state would replace it all.

Under the first set of assumptions, known appropriately as the "doomsday" projections, public sector employment was projected to drop by about 25%, prompting layoffs for about 270,000 employees. This would have the "ripple" effect of sharply increasing the state's unemployment insurance and welfare costs. There would also occur a dramatic decrease in public sector spending which would more than offset any increase in private sector expenditures. The Department of Finance, the Legislative Analyst and the highly respected U.C.L.A. forecasters, projected income and sales tax declines. In addition, some analysts estimated California would lose as much as $2 billion in purchasing power flowing out of the state, primarily in increased federal taxes brought about by lower property tax deductions and property tax savings accruing to out-of-state taxpayers.

For the purposes of this paper, it will suffice to describe projected tax burdens assuming that local agencies of government will be significantly "bailed-out" (they were) and that there will be no large scale increases in other revenue sources (there weren't).

Essentially, Proposition 13 serves to benefit both residential and nonresidential property owners in interesting ways. One of the compelling arguments for Proposition 13 was that taxes were being shifted from nonresidential to residential property taxpayers because of the comparitively rapid growth in residential assessed value. Proposition 13, by limiting the growth of assessed value, would stop that. However, because of the Proposition 13 clause which provides for reassessment upon a sale and because residential property changes ownership much more frequently than nonresidential, the shift of the relative burden from nonresidential to residential will continue, albeit at a reduced rate.

Owner-occupied residential property will receive only about 36.6% of the total relief. Renter-occupied residential property about 18.5% and commercial, industrial and agricultural property about 44.7%. Since renters do not pay property taxes directly, it is difficult to assess the net benefit for renters. In any case, it is expected to be substantially below the $1.2 billion accruing to the owners of rental property.

Individual taxpayer benefits can vary appreciably and making assumptions about the incidence of taxes by level of income is a relatively uncertain proposition. However, the Legislative Analyst has prepared a table which, when holding other variables constant, displays that the impact of Proposition 13 on property taxes is mitigated by federal and state income taxes. Table 3 shows that the reduction in property tax alone tends to be regressive but when state and federal income tax interaction is included, the results are tempered, with the largest percentage of tax relief accruing to low income homeowners. If, however, homes occupied by lower income citizens are resold at a faster rate than higher income generating households, the advantage may be short lived.

Table 3

Illustration of Net Tax Reduction at Selected Income Levels
Married Homeowner With Two Dependents

				Net Tax Change			
				Before State/Federal Income Tax Interaction		After State/Federal Income Tax Interaction	
Total Family Income	Average Home Market Value	Current-Law Net Property Tax	Proposition 13 Net Property Tax	Amount	Percent	Amount	Percent
$ 5,000	$30,000	$ 425	$122	$-303	-71.3%	$-303	-71.3%
10,000	34,000	505	150	-355	-70.3	-355	-70.3
15,000	37,500	575	174	-401	-69.7	-309	-53.7
20,000	42,500	675	209	-466	-69.0	-340	-50.4
30,000	54,000	905	289	-616	-68.1	-394	-43.5
50,000	72,000	1,265	415	-850	-67.2	-400	-31.6
75,000	80,000	1,425	471	-954	-66.9	-344	-24.1

In sum, the largest portion of tax relief from Proposition 13 accrued to owners of business, commercial, agricultural and renter-residential property. That proportion of the relief will grow as property tax burdens continue to shift toward owner-occupied residential property. Renters' relief is uncertain, but undoubtedly less than the amount of relief enjoyed by owners of renter-residential property. Finally, when one takes into account federal and state income tax interaction, the net impact of Jarvis is not as regressive as it first appeared, but that may altered if homes occupied by lower income citizens change hands at a faster rate than those owned by high income citizens.

While the outcome of Proposition 13 for owners of property was undoubtedly welcomed by most, the projected impact on the revenues for local agencies of government was senn by supporters of those agencies as catastrophic.

C. Projected Revenue Impact on Local Government

In the following section we will look at the estimated revenue losses for local govenrment caused by the passage of Proposition 13. The State of California contains 58 counties, 413 cities, 1,114 school districts (including community colleges) and between 3,500 and 4,000 special districts. The plethora of districts has caused several observers to note that much of the growth in local district expenditures can be attributed to the number of local entities which resulted in a lack of organized oversight, interdistrict coordination and fiscal responsiblity.

It is important to emphasize the relative size of the revenue loss. In 1978-79, local government entities in California would have had total revenues exceeding $30 billion, absent Proposition 13. With its passage, local governments faced a devastating $7 billion loss in revenue; this represents a 22 percent loss in total revenue and a 57 percent loss in property tax revenue. Quite obviously local agencies most dependent on property taxes as a source of revenue would be more heavily impacted. Schools were potentially the most adversely affected with a projected loss of 30 percent of their total revenue. Counties were projected to lose 23 percent of their total revenue, with cities being the least adversely affected, losing a projected 15% of their total. Special districts vary widely in their reliance on property taxes that an average figure for their losses would be meaningless.

1. *Counties* The 58 counties in California provide a wide variety of services, some as an arm of the state, others as mandated by the state and still others as desired by voters within each county.[7] California's county governments reported general revenues of $8.85 billion in 1977-78, of which 33.2 percent came from property taxes and 49 percent from the state and federal governments. Expenditures totalled $8.64 billion. An examination

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[7] For further detail about projected impacts on local agencies of government, see the analysis by the Legislative Analyst, *An Analysis of Proposition 13, the Jarvis Gann Property Tax Initiative*, May 1978.

of prior budgets shows that four categories account for over 90 percent of annual expenditures. Below, are brief descriptions of the major county programs:

a. Public Assistance (40% of total) Counties provide cash assistance to eligible children and their parents whose income is below a specific level; cash assistance to eligible aged, blind and disabled; and administer the food stamps program. Counties are required by state law to provide for indigents who do not have adequate means of support. There are many other county programs for which the counties must assume administrative responsiblity including Title XX Social Services, adoptions, and Work Incentive Programs. Most of these programs are state mandated and are not subject to substantial cutback at county discretion.

b. Public Protection (19.6%) Currently funding for the California Court system is primarily a county function and most of the levels of support are state mandated. Expenses of the offices of the district attorney, the public defender and the grand jury are all county responsibilities. Sheriffs, constables and marshalls are under county jurisdiction as are county jails and other detention and correctional institutions. Several counties also serve as providers of fire protection services. These services, because of their nature, are difficult to reduce.

c. Health and Sanitation (13.9%) Counties provide a variety of services dealing with health and sanitation. In terms of total dollars, hospital inpatient and outpatient medical services at county hospitals comprise a major county burden. Although not all counties operate hospitals, it is a major cost consideration for most. In addition, counties offer environmental health programs ranging from air sanitation to animal disease control. These services do not generate much in terms of federal and state dollars and tend to make good candidates for county budget cutbacks. Much less vulnerable, because of substantial state and federal mandates are programs for personal and mental health as well as services for crippled children. Finally, counties also offer sanitation services which in some counties are funded by user fees and others from the general fund. Proposition 13 will undoubtedly create a greater reliance on user fees.

d. General Functions (18.4%) These functions include the general operating expenses for the counties themselves and include expenditures for the County Boards of Supervisors, legal, fiscal, election, property management, plant acquisition, employee benefits and retirement benefits. Some of these programs would be susceptible to cutbacks, most notably property management and plant acquisition services which, because of Proposition 13, would result in a large reduction in workload. Further employee benefits and retirement funding could be reduced but the courts have noted that pensions for existing employees cannot be reduced without violating the federal and state constitutions.

2. Cities Cities, unlike counties and school districts, do not place heavy reliance on the property tax as a source of revenue (only about 15% - 20% is the average and some cities do not even levy a property tax). City governments in California are seen as having the major responsibility of responding to local needs. Consequently, there are fewer mandated state and local programs, and fewer state and federal dollars. Over 85% of city expenditures occur in three areas:

a. Public Safety (32%) Police operations consume a large proportion of the average city budget (20%) with fire protection second. These services are in such high demand by constituents that significant reductions in service levels are extremely sensitive.

b. Public Works (22%) Sewage and waste collection and disposal, street repair and lighting are among the most prevalent expenditures here. Many of these services could become more reliant on user fees as a funding source.

c. General Government (31%) Retirement, insurance and building operation and maintenance make up the largest municipal costs. Some functions are mandated, but most are locally optional and, as such, could be trimmed or have costs replaced by other taxes or fees.

3. Special Districts Special districts are local governing entities which are formed to provide services or to compliment city or county services. Of the 3,800 or so special districts, most are formed as general service districts with a substantial number of fire protection and maintenance districts. The most frequent service required by special districts deals with lighting, followed by water supply and fire protection. Proposition 13's impact on special districts varies greatly between types of districts. Those which rely on user charges or fees (enterprise districts) are much less negatively impacted than those districts which do not (nonenterprise districts). In 1976-77, nonenterprise districts were supported by $1.25 billion in property tax revenues. The average enterprise district would lose only about 8% of its revenue while the average within the nonenterprise is estimated at about 28%.

There are two important conclusions about special districts. First, many of the enterprise districts are in little or no need of state fiscal assistance and second, Proposition 13 must give encouragement to recent efforts to consolidate the tremendous numbert of existing districts, which have historically made it difficult to insure fiscal accountability and have made it virtually impossible to establish a meaningful set of local government priorities. Of the special districts, fire protection is the most visible and among the most popular.

D. Projected Impact on Schools

The California school system, both in terms of variety and size, almost beggars description. There are about 4.3 million public school pupils enrolled in the state's 7,000 public elementary and high schools. These schools are organized into 1,044 separate school districts ranging in size from less than 10 to over one-half million students in the Los Angeles Unified School District. Another 1.5 million students attend one of the 108 colleges in the state's massive community college system. The combined total means that nearly one quarter of California's citizens above the age of four are enrolled in some kind of public school instructional program. Over one-third of the annual state general fund expenditures go to meet the needs of these pupils and their brethren enrolled at the University of California and the California State University and Colleges.

1. Kindergarten through Grade 12 Of the kindergarten through grade 12 enrollment, over one million come from homes where family income is below the federal definition of poverty. Over 300,000 display little or no facility in the English language, and another 450,000 have definable physical or mental handicaps.

In grades K-12 about $9.5 billion was provided to schools in the 1977-78 fiscal year from state, local and federal sources. The state's share represented $3.6 billion, or 38.2% of the total. Local property taxpayers contributed $4.6 billion or 48.7% while the federal government assisted the schools with an $850 million (7.8%) appropriation.[8] Of the total funding sources, nearly $1 billion is spent on one of the twenty-five or so categorical aid programs - many of which are designed to meet the special needs of bilingual, economically disadvantaged or handicapped pupils. California's school budget exceeds the total budget of most states, many countries, and is larger now than the total budget for the State of California a decade ago.

School finance in such a large and diverse state is obviously a problem, especially in terms of magnitude and equity. The slightest adjustment in a school aid formula may cost hundreds of millions or even billions of dollars and may create unforeseen inequities impacting millions of students. The late 1960s was a period of increasing awareness that something was terribly amiss within California's school finance system. That system, like most other school finance systems throughout the nation, was based on the foundation program concept.[9] That concept, which was originally devised to correct interdistrict expenditure variations, had failed to achieve its task because of the relatively low level of the foundation programs compared to average expenditures and the tremendous assessed valuation differences between districts. In 1970-71, for instance, the following ranges existed:

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[8] Another $500 million comes from food sales, sale of property, sale of bonds, interest, fees and rentals.

[9] The foundation program generally provides for a base level of support for each student. If a district has low property values, the state steps in with additional support to guarantee the base.

	Low	High
Assessed value/ADA(i)	$ 75	$1,053,000
Tax rate(ii)	$.39	$ 7.83
Expenditure/ADA	$420	$ 3,447

NOTE: (i)Assessed value = 1/4 of market value.

ADA = average daily attendance.

(ii)Tax rates are levied on each $100 of Assessed Value.

These ranges tend to overdramatize the actual differences by emphasizing the differences between the extremes. Howver, the variations were quite substantial in that year and growing ever more so. The foundation program concept embodied a fixed tax rate so that as assessed values grew a district's revenue grew automatically. The more dependent a district was on the property tax for its revenue and the greater its assessed value growth, the faster its revenues increased.

a. Serrano I In August of 1971, the California Supreme Court, in the case of Serrano v. Priest, ruled that the system just described failed to meet the equal protection clauses of the United States and California Constitutions.[10] The court held that the finance system "invidiously discriminates against the poor because it makes the quality of a child's education a function of the wealth of his parents and neighbors." This decision was to lead to a series of major reform efforts in California as well as a series of court challenges in other states.

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[10] For a fuller discussion see John B. Mockler and Gerald Hayward's "School Finance in California: Pre Serrano to the Present" in Jouranl of Education Finance, Spring 1978, Vol. 3, No.4.

b. Senate Bill 90 The Legislature reacted to Serrano with uncommon speed and in 1972 Senate Bill 90, touted by its advocates as "California's greatest school finance bill" and by its critics as a "fiscal disaster" and "a cruel hoax", was enacted. In conjunction with the Serrano mandate, two other factors contributed to changing the political climate making the passage of this bill a reality. First, California's public schools especially those of lower wealth, had been starved by the conservative fiscal policies of Governor Reagan. Wilson Riles, the newly elected Superintendent of Public Instruction, testifying before the Senate Education Committee in 1971, offered dramatic evidence that there was a genuine school finance crisis when he noted:

- 30 California school districts went broke in 1970 and had to appeal to the Legislature for loans.
- 9,000 fewer teachers were employed in spite of an increase in enrollment.
- 25 percent of the districts reduced the number of classroom teachers.
- California had slipped to 22nd in per pupil expenditures.
- The state also dropped to 42nd among the 50 states in class size, tied with Alabama.
- California dropped to 30th in state aid to local schools.

Next, there were definite signs of what was to become an ever increasing phenomenon, a property taxpayers' revolt. The Legislative Analyst's annual report showed the percentage of the state's share for public schools declining from almost 50 percent in 1953-54 to 31.1 percent in 1971-72. This, of course, meant that the major burden for increased education costs was consistently being shifted to the local property taxpayer.

For California in 1970, property taxes generated $5.23 billion dollars, representing 47 percent of all state and local tax revenues. The next single state-local tax source, the sales tax, generated only about 1/3 of that amount. The schools, heavily dependent on the property tax, felt the crunch and 2/3 of all tax override and bond elections were defeated.

Far more frightening to the Legislature and the Governor than a recitation of data about the incidence of property taxes, was the Watson Initiative, the brainstorm of the Los Angeles County Assessor, Phil Watson. Although Watson's Initiative was soundly defeated by the electorate in November, he scored particularly telling points regarding the property tax revolt and the past inability of the Legislature and the Governor to respond to the demands of the citizens for relief.

Fearing political disaster for both parties, the Democratic Speaker of the Assembly, Bob Moretti, and Republican Governor Reagan joined together to organize a coalition around the Governor's property tax relief bill. In the hope of soliciting support from the educational establishment, provision for new aid to schools and some Serrano compliance features were added.

Although perhaps not as important as the property tax problem, it is clear that Serrano was a highly salient political force in school finance legislation during the 1972 session. The case emphasized the plight of the low wealth school district and gave added impetus to a large number of measures, including SB 90, which did succeed in reducing the expenditure disparity between low and high wealth districts.

Although SB 90 failed to alter the basic foundation program approach to school finance, it, along with AB 1267, a "clean-up" bill of the next session, did contain important Serrano related provisions:

1. Foundation Program Increases SB 90 increased the elementary guarantee from $355 to $765 per A.D.A. (a 115% increase). The high school program increased from $488 to $950 per A.D.A. (a 95% increase). These measures assisted in Serrano compliance by "levelling-up" low expenditure districts and permitting tax rate reductions in low assessed value districts, whether high or low expenditure. Automatic inflation adjustments were also introduced, which tended to keep the

state's share of school aid at a higher percentage.

2. Revenue Limits By replacing a tax rate system with a differentiated revenue limit scheme, two additional Serrano related reforms were initiated. Revenue limits moved future growth in expenditures away from being a function of the growth in assessed valuation, as had occurred under the tax rate system. Under the SB 90 system, if assessed value grew at a faster rate than the permitted revenue limit adjustment, a tax rate reduction automatically occurred. An even more important feature was the "squeeze" factor applied to the annual inflation adjustment. California's revenue limit concept permitted school districts with revenues below the new foundation program amount to grow at a rate of up to 15% per year until they reached the foundation level. Districts at the foundation level were authorized to increase expenditures by an inflation factor of about 6% per year. Districts above the foundation program were "squeezed" by being permitted to increase their expenditures by less than 6% per year.[1]

3. Reduction of Permissive Overrides Prior to SB 90 California school district governing boards were authorized to levy numerous types of permissive property tax increases without a vote of the citizenry. These "permissive" overrides increased the wealth advantage of high-assessed value districts and by eliminating the authorization for future increases in most of these taxes, SB 90 served another Serrano purpose.

The first round of Serrano responses focused on expenditure disparities and tax relief for low wealth districts. However, in subsequent years, high wealth districts also received substantial tax rollback since assessed values often grew at a faster rate than their permitted revenue limit adjustments, thus producing sizeable tax rate reductions.

[1] High expenditure districts were, in effect, double squeezed. The allowable inflation adjustment was applied not to their own revenue limit but to the foundation program which was lower. Very high expenditure districts sometimes got only a 1% or 2% increase.

Finally, it is important to note that SB 90 contained $82 million for the Educationally Disadvantaged Youth Act, a program for districts with high percentages of family poverty, bilingualism and pupil transciency, along with $25 million in 1973-74 and $40 million in 1974-75 for the Early Childhood Education Program, Superintendent of Schools Wilson Riles' program for reforming and restructuring K-3 education.

c. *Jefferson* Shortly after the passage of Senate Bill 90, trial commenced in a Los Angeles Superior Court with Judge Bernard Jefferson presiding. Before the trial was completed, the Legislature enacted another statute, AB 1267, and the Supreme Court of the United States issued its decision in *Rodriguez*. The court held in *Rodriguez* that the Texas school finance statute, a foundation program system similar to California's, was not in violation of the equal protection clause of the Fourteenth Amendment to the United States Constitution.

In spite of *Rodriguez*, Judge Jefferson found that unequal district wealth, as measured by assessed value, produced unequal educational revenues and that unequal revenues produced unequal education quality. Having further found that education was a fundamental interest, the court reaffirmed that unequal educational opportunity was not permitted by the *California* Constitution and that the California public school financing system was therefore unconstitutional.

Jefferson gave the Legislature until September 1, 1980, to reduce any wealth based expenditure differences to substantially less than $100 per pupil. The decision found three features of the state's system to be particularly onerous:

First, the failure of the state to correct for wealth-based disparities in expenditures.

Second, the failure to eliminate the basic aid provision (a $125 per A.D.A flat grant for all the state's A.D.A). Basic aid is distributed equally regardless of district wealth and actually exacerbates wealth related disparities.

Finally, failure to prohibit permissive and/or voted tax rate increases. The former, which require only board approval, and the latter, which require voter approval, both result in greater expenditure variations.

The Jefferson judgement was appealed by the defendants and again the issue faced the Supreme Court. In the meantime, two additional school finance bills were successful, SB 220 and SB 1641. Both bills increased foundation programs, (the "levelling-up" approach), in order to reduce expenditure disparities.

d. Serrano II On December 30, 1976, the California Supreme Court reaffirmed Serrano I and Judge Jefferson's Judgement by a narrow 4-3 vote. The court acknowledged the positive steps taken by the Legislature in enacting four school finance bills since Serrano I, each contributing to Serrano compliance. However, the court found the arguments of the plaintiffs about the inadequacy of the remedies compelling and declared the financing system invalid as denying equal protection of the law as guaranteed by the California Constitution.

e. Assembly Bill 65 The Legislature and the Governor fully expected Serrano II to result as it did. Both houses of the Legislature and the respective staffs of the Department of Education and the Governor were all at work constructing alternative systems, creating simulation models, testing hypotheses and evaluating potential revenue sources. Shortly after the decision, Governor Brown introduced his Serrano compliance proposal and Assemblyman Leroy Greene, Chairman of the Assembly Education Committee, agreed to carry it provided certain amendments could be agreed upon. Senator Albert Rodda, Chairman of the Senate Finance Committee, introduced Senate Bill 525, the principal competing measure. Both bills had similar Serrano provisions but with different emphases. The Governor's bill, AB 65, stressed reduction of tax rate disparities and large categorical aid increases, while the Rodda bill concentrated on the reduction of expenditure variations and included only minor categorical augmentations. Since it was clear that each of the houses would support the bill of its chief school finance expert, a conference committee to resolve the differences between the two houses was inevitable. The final conference committee report on AB 65 was accepted unanimously by the six conferees and adopted overwhelmingly in both houses. The success of the measure was at least partially due to the comprehensive nature of the legislation and its broad appeal to several competing and highly visible demands.

1. Expenditure Equity Substantial foundation program increases totalling $1.8 billion were approved, moving the foundation program level to what would have been the 75th percentile of base revenue limits under the SB 90 system. This was to have been accomplished over a three year phase period. It is estimated that this feature, combined with the "squeeze" factor, would have resulted in 95% of the state's A.D.A. with base revenue limits within a $200 expenditure band by 1981-82.

2. Tax Rate Equity Six features in the bill contributed to the significant reduction of tax rate differences between districts:

   a. Elimination of "Slippage" As assessed values increase faster than state aid, the foundation program operates automatically to shift a higher proportion of school funding from the state to local property taxpayers. This phenomenon is known as "slippage". AB 65 guaranteed that the current state-local ratio would have been frozen, thus eliminating "slippage".

   b. Guaranteed Yield Program The Guaranteed Yield Program was a wealth equalizer for all but the most wealthy districts. This feature provided that the state would guarantee, by increasing state aid, that for any given tax rate in the districts covered, an equal revenue would be produced. Some 85% of the A.D.A. of the state resided in such districts.

   c. Recapture This provided for the recapture of a portion of the wealth of the highest assessed value districts. By requiring these districts to phase in a uniform tax rate per dollar of expenditure which was applied to an increasing amount of the difference between the district's revenue limit and the appropriate foundation program amount, tax rate disparities were to have been reduced. This tax rate was to have been applied to the district's assessed value and the difference in revenue was to have been returned to the state. This was a highly controversial feature of AB 65 but would have fallen short of the 100% recapture which would be required to provide absolute district power equalizing.

d. Minimum Tax Rate This required all districts to levy a minimum tax of $1.00 for elementary; $.80 for high school and $1.80 for unified districts. It had the effect of raising excess revenues in those few districts so wealthy as to be able to fund their programs through a tax rate less than the minimum. Most of the money is produced by low populated, extremely wealthy rural districts.

e. Equalized Local Taxes This provision insured that all future voted property tax increases would be totally wealth equalized. That is, for any future successful election in any district in the state, any given tax rate would produce equivalent dollars of revenue per pupil. This is in direct response to the Serrano II decision, in which the court found the lack of any similar kind of provision the single most objectionable part of the then existing school finance system.

f. Reduction of Basic Aid A minimum of $120 in state funds per pupil is guaranteed by the California Constitution. An additional $5 was provided several years ago by statute. The Legislature merely repealed the statutory $5, a modest reform.

3. Educational Needs The Legislature and Governor responded positively to the needs of the educationally disadvantaged, bilingual pupils and all special education students. Almost three quarters of a billion dollars was provided for these programs over a five year period. The needs of urban districts were also addressed in this bill, which benefited those 19 largest school districts with the highest incidence of categorical aid students.

4. Educational Reform Since 1972, the Legislature, acting on the request of Superintendent Riles, had been moving to provide more discretionary funds at the school site level. The beginning of this effort was Early Childhood Education (E.C.E.). This thrust provided $140 per pupil at the school site level to modify the governance and educational structure at such schools. The concept was that teachers, parents and site administrators ought to have more say over how funds were utilized at the school site. The allocations were permissive. That is, no school district had to participate. If a district chose to participate, it had to (1) have a school level advisory committee, (2) prepare a detailed school level plan which included a needs assessment of each pupil, and (3) agree to address the individual needs of each child in the school in grades kindergarten through grade three. Each school was evaluated both internally according to their adopted plan, and externally by state-hired evaluators. AB 65 modified the provisions of the initial E.C.E. legislation, changed the name to School Improvement Program (S.I.P.), and applied the modified provisions to Grades K-12. Funding was provided to allow approximately 50% of the elementary school (K-6) population and 12% of the secondary school (7-12) population to be included in the program.

In sum, AB 65 was a massive $4.3 billion, five year comprehensive educational package, responsive to the full array of educational demands on the state made by different groups. As a result, it was easily the most significant and popular of California's school finance measures. The leadership in both houses of the Legislature joined with the Governor, the State Department of Finance, the Superintendent of Public Instruction and the State Board of Education to defend the new statute vigorously against any future legal challenges.

Plaintiffs, however, were not quite as sanguine about the passage of AB 65 and argued that its provisions fell short of the standard of compliance called for by the courts.

Both sides, however, joined as one voice to oppose Proposition 13, arguing that its passage would significantly erode the progress already accomplished.

f. Projected K-12 Impact The uncertainties associated with any analysis of Proposition 13 prior to its passage were great. An almost infinite number of potential distributions could occur. However, some estimate of the impact was necessary and most observers assumed that schools would get a pro-rata share of the $4 limit (excluding bonded indebtedness) and that there would be no changes to existing school finance laws.[12]

Absent any state replacement revenues, schools K-12 expected to lose about 56% of their property tax revenue and about 30% of their total revenue, with community colleges losing a slightly larger amount in each category. The Jarvis-Gann Initiative created a distributional irony - high wealth districts which had historically received little state aid because their property tax revenues were sufficient, were projected to suffer the greatest losses. Conversely, low wealth districts with heavy reliance on state support and relatively little dependence on local property taxes were expected to emerge with a much less damaging result. Two examples of this phenomenon should suffice. Baldwin Park, a low wealth/low expenditure district, would lose about 62.1% of its property tax revenue, but because that is such a small portion of the district's total revenue, it would lose only 16% of its total state and local revenue limit. Beverly Hills, a high wealth district, on the other hand, stood to lose 65.6% of its property tax revenue but since it had such little reliance on the state for revenue, that figure represented a 61.4% loss of total revenue. If there were to be no additional state dollars, the low and high wealth districts might find their relative positions precisely reversed. In absolute dollars, Baldwin Park would stand to lose $237 per A.D.A and Beverly Hills $1,759 per A.D.A. The passage of Proposition 13 precisely reversed the *Serrano* problem. Instead of providing added dollars for low wealth districts, the state would now be forced to provide more state dollars to high wealth districts or stand watch over their demise.

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[12] See a document prepared by the Assembly Education Committee staff, "Jarvis Initiative - Impact on Schools".

There has long been an extended and heated debate in California about the approproate manner in which additional state funds should be allocated to local school districts. Most of the "educational establishment" has preferred the "general aid" approach allowing the maximum flexibility for local school boards to determine expenditures. Others have emphasized the "categorical aid" approach, targeting incremental dollars for special students (disadvantaged, handicapped) or special programs (school reform). The passage of Proposition 13 intensified that debate - each side arguing that the cuts ought not to be at the expense of their favorite distributional mechanism. Targeted for extinction by some were such programs as driver training, programs for mentally gifted minors and bilingual education. Others, fearful that certain of their favorite programs, if left solely in the hands of school boards, would be decimated, advocated protective legislation forbidding school boards to disproportionately cut programs such as child care and programs for the handicapped. Since the total amount of dollars annually spent on categorical aids in California approaches $1 billion, categoricals offered an inviting target for potential reductions.

The carefully honed, comprehensive provisions of Assembly Bill 65 were placed in serious jeopardy by the passage of Proposition 13. The foundation increases designed to "level up" to Serrano compliance were placed at risk. All of the tax rate equity mechanisms were rendered totally inoperable. Funds previously set aside for growth in aid for bilingual and disadvantaged pupils and for Superintendent Riles' School Improvement Program were suddenly fair game in the search for potential cuts.

The almost ten years effort to achieve significant, comprehensive school finance reform would be quickly and effectively, and perhaps irrevocably, destroyed by the passage of Proposition 13.

On a more specific, district-by-district level, school superintendents painted

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disastrous pictures of what could occur, absent state aid. Massive teacher lay-offs, strikes and school closures were common predicted results. Substantial increases in class size, the total elimination of athletics and catastrophic reductions in home-to-school busing were also predicted. Program cutbacks in music, the arts and college preparatory courses were also foreseen. Less often mentioned, but highly visible possible cutbacks were also expected to occur in school construction and maintenance. Summer schools and adult programs would have to be all but eliminated. The public was given the picture in hundreds and hundreds of newspaper articles, radio spots, service club luncheons and even in messages carried home by pupils, that the effect on the school district in which they resided would be disastrous.

2. Community Colleges California's 106 community colleges in 1977-78 served more than 1.3 million students with the following diverse characteristics:

—Three-fourths were part-time;

—Most worked full or part-time;

—One-fourth were over 35 years of age, the average being 28;

—More than half were women;

—30% were from minority racial or ethnic backgrounds.

In the 1977-78 fiscal year, community colleges received over $1.3 billion in total federal, state and local aid. The state's share represented $570 million or 43% of the total. Local property taxpayers contributed $667 million, or 50%, with the federal government contributing only $90 million (6.7%).

The community college programs have been amicably referred to as "people's colleges" by virtue of their many sites and their no tuition and open admissions policies. Their programs include courses for transfer to other institutions of higher education, vocational and technical courses leading to employment, general and liberal arts courses and community services.

The community college system of school finance has also historically been based on the foundation program concept. In fact, the system prior to 1972-73 closely paralleled the K-12 system. The problems which brought about the court challenge of the K-12 system also pervaded community college finance. The 1972-73 range in expenditure per A.D.A. was from $814 to $2,173. The disparity was caused precisely by the same factors that generated the K-12 disparities - an unrealistically low foundation program and large disparities in assessed value per A.D.A. between districts.

a. Senate Bill 6 Senate Bill 6 was passed in 1973 to place the community colleges under a revenue limit mechanism roughly equivalent to that in Senate Bill 90. The revenue limit provided for a base year amount per A.D.A. with a built-in annual inflation factor. Like the K-12 mechanism, if assessed value grew at a faster rate than that provided in the limit, tax rate reductions automatically occurred. In order to converge the wide disparity in expenditure, the Legislature utilized a "squeeze" factor by providing lower inflation increases to districts with high revenues per A.D.A. and higher increases to those with low revenues.

The revenue limit concept, while appropriate for K-12 with a well defined clientele, created for community colleges a tremendous incentive to increase A.D.A. Each new A.D.A. would generate a full revenue limit amount. The amount generated far exceeded the marginal cost of adding an additional student and enrollment grew rapidly in response to this incentive. State apportionments, in fact, grew so rapidly that the Governor and the Legislature imposed a 5% "cap" on increases in the number of state-supported A.D.A. for 1975-76. The "cap" created a new set of inequities, especially for districts which were located in areas of rapid population growth. Declining growth districts were not adversely affected.

b. Senate Bill 1641 In 1976, the Legislature enacted SB 1641, an omnibus measure which dealt with a number of school related issues, most importantly community college finance. SB 1641 abolished the cap, as well as the foundation program and revenue limit mechanisms which had prevailed in SB 6. The new system called for a modified return to a tax rate control mechanism, provided state aid at a rate lower than in SB 6 and tied total local revenue to assessed property value, irrespective of the number of students. The new program reduced the incentives for growth in A.D.A. and contributed to a levelling off in district enrollment.[13]

c. Projected Community College Impact Just as for the K-12 districts, the relative stability of a reasonable, workable community college funding mechanism would be shattered by the passage of Proposition 13. Again like K-12, community colleges faced the reversal problem - now the state would have to contribute more state dollars to the high expenditure districts if they were to continue operating.

Since community colleges were slightly more reliant on property taxes than were school districts, it might appear that the estimates regarding impact would be even more pessimistic. However, two factors significantly reduced the likelihood that community colleges would be more negatively damaged than would K-12. Community colleges unlike K-12, have a highly variable number of potential clients. Simply by increasing or decreasing offerings, or by enlarging or diminishing promotional efforts, the numbers of students can be effectively controlled within limits. K-12 does not have that luxury. The pool of K-12 students is fixed and only in the adult programs and in certain optional programs such as summer school, can numbers of clients be varied.

In addition, community college finance mechanisms plus sound management practices have enabled community colleges to build substantial reserves. Only 12 of the 70 community college districts in the state had reserves smaller than 5% of their total revenue. K-12 districts were not in any way similarly blessed.

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[13] Community college enrollment is obviously a function of several factors. Historically, the pattern has displayed an inverse relationship between the California economy and enrollment. That is, when the economy is going well, unemployment is low and enrollments increase and vice versa. It is difficult to assess just what portion of any increase or decline is attributable to any cause. In spite of that difficulty, it is clear that the incentives for growth were less under SB 1641 than under SB 6.

The major concern for community colleges was that when compared with K-12, the colleges would be given a low priority in distributing any state funds to bail out local agencies. If so, the mission of the community colleges to offer low cost education to anyone 18 years of age or over who could benefit from instruction would be threatened.

On a district-by-district basis, the presidents/superintendents of community college districts painted the same kind of dismal pictures of substantial program reductions that were being painted by their K-12 colleagues - substantial lay-offs, community services slashed, capital outlay and maintenance eliminated or deferred, athletics, music and arts programs wiped out and summer programs terminated. More significantly, the specter of community college tuition and the "closing of the open door" was raised.

F. Summary

The Proposition 13 campaign was the "worst of times" for government in California. Never had local agencies received such negative scrutiny. Elected public officials were excoriated and abused in an unprecedented manner. The word "politician" was equated with "untrustworthy", "devious" and "dishonest". The words "civil servant" were often used synonymously with "lazy", "unintelligent" and "parasitic". The addition of the anti-government arguments to the already strongly based anti-property tax foundation was an important key to the initiative's overwhelming success. It is difficult to evaluate the relative effectiveness of the other components of the campaign, but the grass-roots based campaign, Jarvis" newsworthiness, the ineffectiveness of the opposition campaign, and the comparative simplicity of the Jarvis-Gann solution all contributed. Local agencies of government were the big losers.

Owners of business, commercial, agricultural and renter-residential property were the big winners of the election and because of the features of Proposition 13, their proportionate relief will continue to grow. Renters' relief is less certain. Owner-occupied property received immediate benefits but over time those benefits will be exceeded by the benefits to owners of nonowner-occupied property.

The schools saw the elimination of over a decade of school finance reform effort, ending in the passage of Assembly Bill 65, demolished by the actions of the voters on June 6. All of the carefully and thoughtfully drawn Serrano privisions delicately balancing the interests of the different educational and other public interests, were rendered ineffective by Jarvis-Gann. Whether the state can, or will, put the "egg" back together again remains to be seen. But it was not Serrano, nor the School Improvement Program, nor the Bilingual Program, that was the issue of the campaign. The issue was survival. Most school officials argued schools could not survive, or at best, only at a greatly diminished capability.

The campaign and ultimate passage of Proposition 13 did nothing to assuage the government credibility problems. The "doomsday" projection which characterized the passage of Proposition 13 as akin to the outbreak of the plague and predicted catastrophic negative impact to the California economy were, quite simply, overdrawn. Jarvis, portrayed by his opponents as California's answer to the mad bomber, appeared eminently reasonable when he explained that the government, as bad as it might be, would not let fire protection, police services and education be destroyed. Once again, Jarvis was right.

IV. Response to Proposition 13 - Senate Bill 154

As the June 6, 1978, election date approached and as the members of the Legislature and the Governor realized the inevitability of the passage of Proposition 13, they directed their respective staffs to begin work on what was to become known as a "bail-out" bill for local agencies. There was no precedent, in or out of the state. Not since the Civil War had any state been subjected to such a drastic revenue loss. Each house of the Legislature and the Governor began independently drawing up alternative plans for the distribution of the state surplus, estimated at $2.5 billion - $3 billion. At first, many of the proposals contained strong elements of governmental reform. The most noticeable reform was to abolish all special districts and place their functions under the control of County Boards of Supervisors. Also considered were attempts to reorder local priorities at the state level of government, by establishing differential percentage rates of state dollars depending on the relative "worth" of the local agency's functions. While to some degree that policy was implemented; for the most part, as time passed and as the cries for help from the local agencies of government became louder, the impetus for reform and for any attempt to reprioritize local agency functions yielded to the more immediate survival needs of local government.

After Proposition 13 had passed, Governor Jerry Brown dropped the first bomb. He announced that there would be made available to local government for bail-out purposes, $5 billion ($4 billion in grants and $1 billion in the form of short-term loans). Prior to the passage of Proposition 13, the most optimistic estimates were in the $2.5 billion to $3 billion range. Many legislators who had vigorously campaigned against the Proposition and had done so utilizing the figures provided them by the Department of Finance, felt betrayed by the surprise announcement of the larger sum. It was especially galling because the figures more closely comported with what Howard Jarvis had been saying throughout the campaign. The Speaker of the Assembly, Leo McCarthy, was visibly angered by what he considered to be a serious breach in communication between the Governor and the Legislature. But in most quarters, there was general relief that more dollars would be available for the local districts.

A. "Super" Conference Committee

After several preliminary meetings, it was determined that because local agencies begin their fiscal year on July 1, a speedy and efficient process was needed. At first, thought was given to calling a special session of the Legislature. However, the lessons of the unsuccessful earlier special session were remembered and a truly extraordinary alternative was adopted, the appointment of a bipartisan, bicameral, super-committee. This committee would be made up of the Speaker of the Assembly and his counterpart in the Senate, the President Pro Tempore; they would be joined by the chairmen of the respective fiscal committees and the leader of the minority party of each house to serve as the third conference committee for Senate Bill 154.[1] The appointment of the supercommittee virtually guaranteed the passage in each house of whatever the conferees could agree upon.

Veteran capitol observers could recollect nothing like the conference which was to follow. The conferees were responsible for the distribution of $5 billion in state general fund resources. This sum represented a larger dollar amount than any annual budget for the entire state until the administrations of Governors Reagan and Brown. The committee was to find solutions to these knotty problems in a "circus" atmosphere with television and newspaper reporters from all over the country watching their deliberations.

The conference proceedings can be divided into three parts. The first - testimony from the public - generally representatives of local agencies and anti-tax advocates such as Paul Gann. The second was a period of political rhetoric as both political parties struggled to gain whatever political advantage could be achieved. In this period the Republicans scored fairly heavily by insisting that the level of service for fire and police protection not be cut below 1977-78 levels, a stance which the polls showed to be highly popular. The third period consisted of a response to the myriad of legislative staff proposals on the allocation of the $5 billion.

As the latter stages progressed and as more alternatives were discussed, the conferees became more and more convinced that a simple approach would be necessary in order to guarantee legislative passage. Virtually every attempt at large scale reform or reallocation of resources was dismissed as being impractical or politically dangerous, or both, in the short term. The general philosophy emerged that local agencies should each get a fixed percentage of what they would have expected in 1978-79 had Proposition 13 not passed and that each local agency was best suited to determine its own expenditure patterns.

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[1] Bills must pass both houses in identical form. If they do not, differences may be resolved by a joint conference committee. The resulting conference committee report must then be adopted by both houses. Any single piece of legislation is limited to three such conferences. SB 154, the vehicle for two previous failures to enact tax reform, was the logical choice for a third and last try.

B. SB 154 - Provisions

Senate Bill 154 was ultimately adopted unanimously by the Joint Conference Committee, overwhelmingly by both houses of the Legislature and signed immediately by the Governor on June 24, 1978. Its passage proved that the Legislature could act quickly and responsibly to meet a crisis and at least partially restored some of the confidence lost during the Proposition 13 campaign. In just two and a half weeks the Legislature had successfully distributed over $5 billion in state funds to provide assistance to local government. SB 154, and subsequent clean-up legislation, provided the following allocation of state funds:

Local Agency	Amount ($ million)
Counties	$1,480
Cities	250
Special Districts	162
Schools, K-12	2,072
Community Colleges	260
Emergency Loan Fund	870
Bond Default Loans	30
Total	$5,124

The major features of the BS 154 bail-out included:

1. Restrictions Most of the funds were in the form of block grants, allowing local discretion, however several restrictions accompanied the dollars:

—Local agencies receiving bail-out funds could not offer cost-of-living increases to their employees which exceeded cost-of-livng increases for state employees. To do so would mean a loss of all bail-out funds. Since in later budget action state employees were granted no increase, this policy resulted in a pay freeze. This provision was subsequently found by the California Supreme Court to be unconstitutional, but many state and local employees failed to receive a pay increase for 1978-79.

—The first priority of funds allocated to cities, counties and special districts was the maintenance of police and fire services at 1977-78 levels. This provision was insisted upon by the Republican members of the conference committee who successfully argued that these were viewed by the public as the highest priority local services.

—Several services such as certain county public health, inpatient and outpatient services, child care, and programs for the handicapped, could not be reduced disproprotionally beyond the loss of revenue for the agency as a whole.

—Local agencies with general fund reserves in excess of 5% of their operating budgets were expected to contribute one-third of that excess to offset state bail-out monies.

2. Distribution of Property Taxes The 1% property tax allowed by Proposition 13 was required to be levied and revenues were to be allocated on a pro rata basis - cities, counties and special districts were to receive three year average shares of property tax revenue with schools, county superintendents and community colleges using a single year, 1977-78, as their base.

3. Distribution of State Assistance

a. Cities Those cities which sustained a property tax loss because of Proposition 13, received $250 million. Cities were to be reimbursed based on their tax loss compared to the property tax loss of all cities statewide, which amount was projected to be about 90% of projected 1978-79 revenues had Proposition 13 not passed. The money was in the form of block grants with local discretion of expenditure except for the restrictions cited above.

b. Counties SB 154 relieved counties of their fiscal liability for several health and welfare costs including Medi-Cal and AFDC grants. These "buy-outs" totalled over $1 billion. In addition, $436 million was authorized in block grants offsetting the property tax losses for other functions of county government. The figures were projected to guarantee counties about 90% of their expected 1978-79 revenue had Proposition 13 not passed.

c. Special Districts Special district funds were not distributed directly to the special districts but were allocated to counties who in turn reallocated the $162 million to the special districts within the county. Each county received the apportionment based on the total tax loss of all special districts within the county. Priority was given to districts with high property tax reliance and low reserves with an additional proviso for fire and police mentioned earlier.

d. School Districts SB 154 allocated $2.044 billion in state aid to guarantee, on a statewide basis, an average 90% of estimated 1978-79 budgets. In order to maintain movement toward Serrano compliance, high expenditure districts were required to take a 15% cut while low expenditure districts were to trim only 9% off their 1978-79 projected revenues. Prior year amounts for summer school and adult programs were included in each district's base used to determine the level of the block grant for 1978-79. However, districts were not required to offer these programs. This provision created an interesting competition between funding categories. The school district will receive no additional funding for offering summer session or adult school. Therefore, offering either of those programs reduces the amount available for the regular programs. Several other program restrictions were removed and local districts were given greater flexibility in their expenditures.

While districts were generally given greater flexibility, several maintenance of effort provisions prohibiting disproportionate cuts in programs were added to protect child care, handicapped, certain courses for adults and summer courses required for graduation.

Finally, the categorical aid programs cited below were each reducted by 10% of their projected 1978-79 levels.

Categorical Aid Funds K-12
(In Millions)

Program	1978/79
School Improvement Program	$137
Educationally Disadvantaged Youth	126
Compensatory Education	4
Special Elementary School Reading Instruction	16
Bilingual-Bicultural Education	14
American Indian Education	1
Instructional Materials	31
Child Nutrition	39
Mentally Gifted Apportionments	15
Regular Transportation Apportionments	68
Driver Training Apportionments	23
Urban Impact Aid Program	49
School Personnel Staff Development	1
Assistance to Public Libraries	5
	$529

e. Community College Districts Community colleges were guaranteed, through the block grant approach, 85% of their 1978-79 projected revenues. There was no attempt to equalize expenditures by requiring a larger reduction for high spending districts. The 85% figure was chosen for community colleges rather than the 90% for other local agencies because most community colleges enjoyed higher than average reserves and had greater client flexibility than other agencies. The same program restrictions regarding child care, handicapped programs and certain programs for adults were applicable to community colleges. Community colleges, like K-12, had the option of offering summer sessions. Their funding base included dollars for summer sessions, but the districts were not required to offer these.

C. Impact of Senate Bill 154

The deliberations surrounding Senate Bill 154 represented the Legislature's desperate attempt to sort out what the voters were really saying when Proposition 13 was passed. Was it solely a property tax cut measure or an attempt to cut local government services drastically? The Legislature opted for the former formulation arguing the proposition was primarily a tax cutting device and that, with the available state resources, cuts to local agencies should be minimal. The Legislature was particularly impressed by the arguments that if local governments were forced to assume all the revenue loss, the economic dislocations for the California economy would be so severe as to disrupt California's economic activity seriously. It was decided to devote a large amount of the state's surplus in order to "bail out" local governments in the short run and buy time so that local agencies would be able to make personnel adjustments through attrition and program adjustments incrementally.

As this paper is written, it is much too early to tell the ultimate impact of Proposition 13. Clearly, the quick and substantial aid to local government approved in SB 154 masked the real impact which may not be fully felt for several years. The state's economy, its revenue producing capability, state agency cutbacks that will have to be made, and the period of time taken to use up the state's surplus, will all play a role in establishing the date at which "the other shoe will drop" and local agencies will clearly understand what has happened to them.

If one were forced to summarize the first year impact on all local agencies of Proposition 13, one would conclude that the Proposition 13 impact has not been highly visible. The average California citizen has not been directly and forcibly impacted negatively by the loss in local agency services. That is not to deny that specific services have been reduced (especially libraries and parks), but because of the generous bail-out contained in SB 154, local governments have not disappeared, nor have they suffered dramatically. This, of course, is precisely what Jarvis had argued. The Legislature, by its timely and generous response to the Proposition 13 crisis, probably further eroded public confidence in its integrity because the dire consequences it predicted simply did not come to fruition. To look at impacts of specific categories of government we will be largely dependent on surveys conducted by the Department of Finance, the Department of Education, the Community College Chancellor's Office and by a special Commission appointed by the Governor.[1]

These surveys, while helpful in establishing some generalizations about the impact are not very precise indicators of Proposition 13's impact, because of reporting irregularities, incomplete information, and timing. Much more important will be surveys conducted after this fiscal year when actual 1978-79 expenditure and revenue data can be compared with actual 1977-78 information. Even though the conclusions to be drawn from the utilization of the surveys are of necessity tentative, a definite pattern of decisions across agencies emerges which may be useful in projecting future impacts.[2]

In the next sections we will examine the impact of Propostion 13 on the state and federal governments, cities, counties and special districts and, finally, schools.

1. State The major and most direct impacts of Proposition 13 on State government were:

   a. In the short run, the increase of tax revenues caused by increased income and business and corporation taxes (less property tax deductions) and savings in reimbursements to local governments for property tax relief programs (less property tax incidence means smaller subventions), and

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[1] This Commission, chaired by the recently retired and and highly respected former Legislative Analyst, A. Alan Post, and including Los Angeles Mayor Tom Bradley, Superintendent of Public Instruction Wilson Riles and other luminaries, was viewed by skeptics as established more to buy the Governor time during his re-election campaign. The diverse makeup of the Commission almost precluded making any wide-ranging, agreed upon recommendations.

[2] For further detail, see: A Study of the Local Government Impacts of Proposition 13 by the State of California Department of Finance; the Final Report of the Commission on Government Reform; and Summary of Proposition 13's Impact on Community Colleges by the Chancellor's Office of the California Community Colleges.

b. In the long run, the restrictions on the state's ability to increase taxes (by requiring a 2/3 vote and by prohibiting any increases in property taxes).

In addition, by forcing the state to contribute increased state dollars for local government, the number of dollars for state programs is thereby reduced. Dramatic evidence of this phenomenon was displayed when, after the passage of Proposition 13, the Governor and the Legislature reconsidered the allocation of funds to state agencies in the Governor's Budget. The Governor's Budget, as signed, was $1.5 billion less than introduced, a reduction of approximately nine percent, the largest decrease in state history. The largest decreases occurred in health and welfare progams (a $216 million drop - mainly loss of cost-of-living increases for welfare recipients, loss of increases of fees for Medi-Cal providers and loss of expansion of local mental health services); state employee salaries (a $201 million drop - state employees received no cost-of-living increases for 1978-79) and general state agency reductions (a $130 million drop - caused by making across-the-board cuts to all state agency budgets).

2. Federal Federal impact is extremely difficult to assess. The California situation is truly unprecedented. It appears that there will be both positive and negaative benefits. Federal income tax revenues will increase because of the reduced property tax deductions. However, if there is a dampening effect on the national economy, federal revenues may decline.

Since many federal assistance programs require a local match and contain "mainenance of effort" provisions, to the degree that California governments may be unable to provide the requisite local match, federal costs may decline. Again, because of the magnitude of the bail-out, there appears to be only a minimal immediate loss of federal funds to California. Because about 80 percent of all federal grant dollars are in programs with these requirements, the long range potential impact cannot be ignored. California stands to lose substantial amounts of federal dollars unless replacement revenues can be gained from the state or unless the federal government eases its matching requirements to reflect California's loss of revenue.

3. *Local* As mentioned above, 1978-79 generally was not a year of a sharp decline in local agency budgets due primarily to the magnitude of the bail-out. The property tax losses were also partially offset by the state aid and an increased use of fees (about $200 million), spending down of prior reserves, no salary increases for local employees and cutting back on expenditures.

According to the Department of Finance, total *revenue* for 1978-79 is projected to be down only 2.4 percent from 1977-78.[3] However, total *expenditures* will be up slightly statewide by about 5.2 percent, including capital outlay expenditures. At this point it is important to discuss the difficulties in making mid-year assessments about revenues and/or expenditures. By necessity we must look at the *actual* prior year expenditure or revenue and compare that figure with the *budgeted* 1978-79 figure. Unfortunately that process leads to misleading results. Historically, local agencies have overestimated their budgets in order to be safely within the budgeted figure. It should also be noted that in 1977-78 the tendency was even greater. The comparison is distorted even more than usual because local agencies began to make cuts and impose hiring freezes in 1977-78, as the the enactment of Proposition 13 became more imminent. In fact, 1977-78 expenditures were almost 10 percent less than budgeted for the same year. Most of the effects of Proposition 13 and the bail-out bill are not local agency specific in nature and prove to be reasonably consistent across types of local agencies.

a. *Capital Outlay-Maintenance* Most local agencies relied on the sale of local general obligation bonds to finance capital improvements. The bonds were secured by the tax levy on the property of the district sufficient to cover the debt service. However, Proposition 13 prohibited any new property taxes of any kind and all local government capital outlay funded by this mechanism was virtually eliminated. Most local governments will be forced to defer major capital outlay projects unless alternative funding mechanisms can be developed. Maintenance of existing capital is also suffering in 1978-79. Agencies repeatedly cited cut backs in the maintenance budget, because they felt expenditures of public funds to avoid employee layoff was a higher priority. Deferring building and equipment repair is bad public policy — the buildings do not fix themselves and the costs of repair have a tendency to grow at rates even faster than normal inflation.

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[3] Excluding enterprise special districts.

b. Public Employees Local public employees, bacause of the prohibition on salary increases for cost-of-living were forced to bear a large portion of the costs of Proposition 13 compliance. Even though the California Supreme Court was later to declare this provision unconstitutional, by the time the decision was rendered the fiscal year was more than half over and prospects for getting any increase for many employees were very dim.

Layoffs fell far short of the figures projected by most analysts. Again, the size of the bail-out and the restrictions on cost-of-living adjustments made it possible for most local agencies to maintain their staffs. Of those initially dismissed one third were rehired. Layoffs were surprisingly low, only about 18,000 is the estimated net layoff figure. However, a number of positions opened because of retirement or resignation have gone unfilled. Layoffs when they have occurred, occurred disproportionately in part-time categories. In addition, the Employment Development Department reports that several job classifications, such as electronic data processing personnel, engineers and health personnel, are leaving public service for private industry. The Department further reports that the total number of local government civil service employees declined by 8.4 percent (108,000).

In response to SB 154, state and local governments imposed hiring freezes. Jobs made vacant by retirement or other attrition were simply not filled. This leads to another negative result for local agencies. Those areas where personnel cuts are occurring may not be the areas where staff reductions outght to occur. Salary savings generated by not filling the vacated positions may assist agencies to survive in the short run, but are not available in the future.

Retirements were reportedly increasing at a rapid rate, especially in those cases where an individual felt a demotion was a high probability. Individuals, where they were able, often tranferred from non-mandatory programs to programs mandated by the state or federal government — those programs were the least likely to be cut.

Indications are that in all sectors of local government, the average workload was higher. Agencies tended to make across-the-board cuts and tried to avoid layoffs and program service cuts wherever possible. These policy decisions lead, almost automatically, to workload increases for the employees. Workload increases were of course, not rewarded by higher remuneration.

The one impact almost almost always mentioned in the agency responses dealt with the declining morale of public employees generally. For the most part public employees are not exceptional risk-takers. Many became employees of public agencies because of the relative security involved in such positions. Many also sought public employment because they had a genuine desire to serve the public. Proposition 13 was a nightmare for these people. Never have public sector employees been subjected to such intense criticism of their work and even of their motives and rarely has public employment been so uncertain. Transfers and demotions were common and although layoffs were relatively rare in the first year, the certainty that more extensive layoffs were ahead, heightened the anxiety of civil servants throughout the state.

c. Planning The uncertainty of future funding has led to a severe diminution of the planning capabilities of all local agencies. The planning function is often among the first programs to be cut in times of limited resources just when agencies are faced with decisions about reprioritizing current tasks. It is another of the ironies of Proposition 13 that just as the planning function becomes more important - planning is even more essential in times of fewer resources - the dollars available for planning have been diminished.

d. Programs Most of the cutbacks in 1978-79 were flat percentage cuts across-the-board. A typical budgetary directive was to reduce travel, maintenance, etc. in all departments within an agency. Again, the goal was to minimize the number of layoffs. Those programs which did get cut tended to be programs in nonessential (but not unimportant) areas. Libraries, parks and recreation and cultural affairs tended to take the heaviest cutbacks. Even in those cases, the services were rarely eliminated - in most cases the hours the facilities remained open were reduced.

Because of the language in SB 154 prohibiting cutbacks in police and fire services, those programs were almost universally maintained at 1977-78 levels.

e. Fees Fees were increased in a number of areas but the statewide aggregate of fees collected did not provide substantial replacement revenue. Speculation is that if the state dollars had been less, the imposition of fees would have been greater. Local officials were reluctant to impose fees on their constituents because of the adverse reaction they received from citizens who argued that Proposition 13 was intended to cut government revenue, not increase it. In some cases the imposition of a new or higher fee led to a reduction of the particular service. Reluctance to fee imposition may lessen as the revenue picture becomes tighter.

4. School Districts Pursuant to Senate Bill 154, the average school district was projected to receive 90 percent of its projected 1978-79 income. This represents about a 2.7 percent decline over the average total revenue for 1977-78.

Many of the school related impacts of Proposition 13 were similar to the impacts already noted for other local agencies. Schools saw capital outlay and maintenance among the first services to be cut. Their employees, like others, received no cost-of-living increases, although some districts may grant such raises retroactively since the Supreme Court has ruled the pay freeze unconstitutional. District part-time employees, as compared to full-timers, suffered disproportionate cuts. Full-time certificated employees suffered fewer layoffs - many were subsequently rehired. Morale of school employees was almost universally stated as a principal problem and evidence is growing that more and more teachers are exploring early retirement or considering a transfer to the private sector.

School districts did not opt to cut the length of the academic year although a few districts reported a shorter school day. About one half of the districts reported cuts in numbers of teachers and/or aides, which undoubtedly will convert to an increase in average overall workload. Summer school and adult education appear to be the school programs most adversely affected. Many districts, given the uncertainty of funding, cancelled summer school except for students who needed summer courses in order to graduate and students who were enrolled in year round programs for the handicapped. It now appears that attendance generated by adult programs will drop from one third to one half of the 1977-78 attendance levels. Both of these reductions are predictable given the funding pattern established by SB 154. By providing block grants, actually offering an optional program like adult school or summer school represents a cost to the district but no additional revenue. In the competition for limited dollars, these two programs were losers.

Many districts also charged fees for the first time for courses which had previously been offered at no charge. The imposition of these fees tended to drive away students, especially senior citizens.

About one quarter of the districts reported reductions in instructional support services and auxiliary services for food and community services. General support for school operations and transportation also dropped. Districts frequently reported they responded to the revenue costs by reorganizing in an attempt to increase efficiency.

There appears to be no noticeable Proposition 13 impact on the number of students served in the multitude of categorical aid programs. However, the total dollars available for these programs were reduced by 10 percent. The services available to these students have probably been reduced by the slight reduction in the number of employees available to provide the services.

With the exception of the negative impact on its employees' salaries and the sharp drop in adult schools and summer schools, most schools did not incur highly visible reductions. The result can be attributed to the amount of state dollars made available in SB 154 and the savings for the districts by not paying cost-of-living increases. Schools which appear to have been injured the most are high expenditure (they were required to take a 15 percent cut) and small (they were not able to accommodate the reductions because of size). Most of the smaller districts have a very limited number of functions which they could successfully eliminate.

5. Community College Districts **Pursuant to SB 154, in 1978-79 community colleges will receive approximately 85-87% of the 1978-79 income they would have received absent Proposition 13's passage. This represents about a 6% decline from the 1977-78 level.**

Community college districts responded to the loss of revenue in 1978-79 by reducing the numbers of courses (down 6%) and sections (down 13%) offered. Section sizes were increased by about 5%. Major programs dropped were recreational (down 66%) and offerings for senior citizens (down 50%). Summer sessions were cut by 50%. Overall A.D.A. in the system was reduced by 9.3%, including a 50% drop in summer session. Part-time students declined at a higher rate than full-timers. Colleges also substantially reduced student services, especially in the areas of counseling, athletics and libraries.

The pattern for college employees is not significantly different than for K-12. Full-time faculty declined by only 2.1%, while part-timers dropped 22.9%. The same pattern was displayed among classified employees. Although community colleges were subject to the pay freeze provisions of SB 154, many districts maintained enough reserves to pay salary increases retroactively in case the court voided the SB 154 provisions. It is now expected that most community college employees will receive a cost-of-living increase of some kind during 1978-79.

Student fees were increased about 9% over the prior year, primarily by increases in existing fees and by charging new fees for recreational and community service classes.

D. Summary

The legislative response to the passage of Proposition 13, in balance, probably further eroded the public's belief in the credibility of their elected officials. In a very real sense, by responding so well to the needs and demands of local government, the Legislature may have produced an ironic result. Their actions precluded the kinds of catastrophic results most of them had predicted. By providing adequate resources, they may have further diminished public confidence in their veracity and enhanced the Jarvis image. The Governor, because of his quick switch from vigorous opponent to enthusiastic implementer, is frequently referred to a "Jerry Jarvis" and his political prospects may have suffered by his apparent vacillation.

The Legislature, by almost any standard, had responded to Proposition 13 in a responsible and timely manner. With a rare singleness of purpose, in less than three weeks, the Legislature provided a plan to distribute $5 billion to local government. Had there been such a singleness of purpose in enacting a property tax relief measure, perhaps there would have been no need for Proposition 13. The very size of the bail-out provided enough resources so that, for the most part, the public service cuts had little visible impact on the average citizen. Local agencies tended to make the cuts in those areas of their budgets which did not have a direct impact on the citizenry. This too may have produced an ironic result. Because the government cutbacks have not been highly visible, Paul Gann has been able to argue that government has not been cut back adequately enough to match the "Spirit of 13". He has since qualified another initiative to be voted on in the fall of 1979 or the summer of 1980, which would further constrain the revenues for local government.

The cuts that were made were remarkably similar across agencies and included deferral or elimination of capital outlay or maintenance, loss of cost-of-living adjustments by almost all state and local employees, a reduction in planning, program cuts (but not close to those projected) and the increased utilization of fees. Fire and police services were among the least cut.

A significant long term problem is the dramatic decline in the morale of public employees and the possible negative impact of the campaign on potential public servants.

School cutbacks were not dissimilar from those of other local agencies, with summer schools and classes for adults taking a disproportionate share of the program losses.

The most important impact of the legislative response to Proposition 13 may well be the lack of felt impact of the Proposition on most of California's citizenry. This has led to demands for additional cutbacks in governmental services, increased pressure for further tax relief and the enhanced exportability of the Proposition to other states.

V. The Post Proposition 13 ERA

Although the short term consequences of Proposition 13 are not as devastating as either its proponents hoped or its opponents feared, the Proposition will undoubtedly have significant repercussions in California and across the country. United Press International recently reported that 34 states have either proposed or enacted major tax cut programs this year. Of the 16 remaining states, two had already enacted significant reforms. Most states are considering substantial tax cuts, almost none - tax hikes. This movement is definitely a response to Proposition 13 and represents substantial political pressure to reduce taxes and government spending. Texas, because of its gigantic surplus (California and Texas account for nearly one half of the state surplus for all states) is seriously considering a tax relief program exceeding one billion dollars. While it is unlikely that tax reduction devices in the form enacted in Calfornia will sweep the country, strong inpetus has been given to a wide variety of other tax reduction or expenditure cutting proposals. The unexpectedly modest reductions in local agency budgets in California may encourage other states, but it must be remembered that no other state has experienced the kind of surplus that enabled the Legislature to so substantially bail out local government.

The California situation will change abruptly when its economy is no longer able to sustain the extended growth it has enjoyed over the last decade. The California Department of Finance is projecting a recession for California beginning with the last quarter of 1979 continuing into 1980. If that projection holds true, the state will experience serious difficulty in meeting the demands of local government for the 1980-81 fiscal year.

A. State

There are several predictable outcomes of Proposition 13 which will change the face of state government. The extent of the change will depend largely on variables unknown at present but the major changes appear to be:

1. Centralized Decision-Making Another in a long string of ironies of Proposition 13 is that decision-making will probably move away from that sector of government people are most generally favorable toward - local government - to the state, which currently has low marks in public satisfaction. As local budgets compete with state agencies for the revenues of the state, the Governor and the Legislature will inevitably take a closer look at many local functions, especially those with prodigious growth rates, such as health and welfare. Proposals are now being considered by the Legislature to shift the funding of these public services as well as educational services to the state. Although shifting the source of funding from local sources to state sources does not necessarily mean a transfer of decision-making authority, the temptation for the Legislature to decide how those funds are to be spent will be difficult to overcome.

2. **Increased Scrutiny of State Agencies** The Governor and the Legislature will also demand closer budgetary review of existing state agencies. Efforts are already underway to reduce the number of governmental agencies, commissions and regulatory and advisory boards. The Legislature will also take a careful look at state agency regulations which often add costly mandates for local government.

3. **Tax Cuts** The pressure for relief, somewhat abated by the passage of 13 and the subsequent legislation which returned a billion dollars to taxpayers in 1978, is still very real. Governor Brown's 1979-80 budget contains a proposed additional billion dollars plus for tax relief. So far, the Legislature has not responded to the Governor's request, preferring to provide funds for local government and to see how the economy performs before committing to added relief. Howard Jarvis is currently circulating an initiative petition, called Jarvis II, to cut the income tax in half and to freeze the sales tax at its current level. The election year, 1980, will create in California added pressure for substantial tax relief, especially if state surplus continues at its present size. Obviously, large tax cuts reduce the capability of the state to respond to the needs of local government.

3. **Expenditure Limits** Californians will face another proposition in the fall of 1979 or the summer of 1980 which proposes to limit the expenditures of both state and local agencies of government. This initiative, sponsored by Paul Gann, qualified easily and is expected to pass overwhelmingly. Any revenues collected by state or local government must be returned to the taxpayers if those revenues exceed authorized expenditures. Authorized expenditures are not to exceed base year (1978-79) expenditures plus increases in the consumer price index and population. Expenditure limitation measures were bottled up in the Legislature last session and Gann took the initiative route to bypass the reluctant Legislature. At least ten similar limitations were introduced by the Legislature this year as the members stampeded to get on the limitation bandwagon. The ease by which Gann qualified his initiative and a promise by Assembly Republicans to

bottle up any alternatives, points to the district possibility that once again the public will overrule legislative judgement. This initiative, plus Jarvis II mentioned earlier, marks a continued trend to bypass the normal political process when the Legislature fails to respond.

4. Public Employees Public employees will have their noted political power severely tested as the civil service system undergoes its most intense examination. The state's Little Hoover Commission, a respected government reform body, soon will report to the Legislature on recommended changes to the system. Governor Brown has pledged to materially reduce the number of state employees and he took the lead in insisting that state employees not receive cost-of-living increases in 1978-79. Brown is currently holding firm on no retroactive pay increases, but has recently offered a 10.5 percent increase for 1978-79. The California State Employees Association has countered with a promised work slowdown or strike if their demands for retroactive pay and increases for 1979-80 do not total 15 percent. The California Highway Patrol has just commenced its first ever "sick-out" and the prospects for similar state employee actions have never been greater. The concerns of the public about the civil service system will be countered by increased employee dissatisfaction and militancy which observers predict could lead to an attempt to repeal the civil service system by the initiative process. Few civil servants would care to wager on the outcome if the test were to come. In any case, it is a time of increased frustration for the state's employees.

5. Political Changes The immediate short term impact of Proposition 13 on the politics of the state was to swell the ranks of the fiscal conservatives in the Legislature. In addition, formerly liberal and moderate members moved distinctly to the right in the wake of 13. Only a few members of the Legislature, mostly those from politically "safe" districts, did not alter their prior positions. Republicans, many of them endorsed by Jarvis, made the biggest legislative gains since the Reagan landslides of the sixties Fourteen new Republicans joined the Assembly, ending the period when the Democrats

controlled the house by more than the two-thirds necessary to control the budget and other appropriation bills. In the immediate past, if the Assembly Democrats could agree, the Republicans could be ignored. That's no longer the case as the new breed of fiscally conservative Republicans have dumped their relatively cooperative party leadership for a more partisan, fiscally conservative group and will play a significant role in all the key issues before the Legislature. It remains to be seen if the Republicans can sustain and build on their impressive gains of 1978.

Proposition 13, the Gann Initiative, and tax cut issues have so far virtually paralyzed the Legislature. Veteran political observers report they cannot remember a legislative session when so many important issues went unresolved for so long. There's still no clear path for the Legislature to pursue. Gale Cook, a political reporter for the San Francisco Examiner, observes that the Legislature is leaderless as the Governor has his eye on the White House and the other legislatuve leaders have their eyes on the governorship.

As the competition increases for the respective shares of the state pie, former allies in the allocation process have shifted from trying to build coalitions for more dollars, to protecting their own specific programs. It becomes harder and harder and harder to build the two-thirds support necessary to pass the budget and other appropriation legislation. Unless this splintering trend is reversed, the Legislature will be frozen into total inertia and public disenchantment will grow.

B. Local Agencies

Cities, counties and special districts will find their futures radically altered. Although it is not yet clear what the path of local governance will be, it is certain that it will be different than the status quo. Of the three, special districts are the most vulnerable. Several key legislators had expressed support for reorganizing local government along more orderly grounds. Proposition 13 speeded up that process. The major changes appear to be:

1. Consolidation and Reorganization The continued autonomy and even the existence of many of the almost 4,000 special districts in the state will be among the most obvious challenges to local agencies. The Legislature either will provide for a substantial reduction in special districts themselves or indirectly address the problem by permitting county boards of supervisors to allocate special district bail-out funds among competing districts. In either case, some of California's more esoteric districts (such as school crossing guard districts) are clearly in jeopardy. It makes little sense to continue the current proliferation of special districts and it appears that Proposition 13 will assist in the realization of a long overdue reform in local governance.

2. State Assumption Largely because of the state's concerns about unnecessary costs of some of the current state mandated locally administered programs, it is expected that much of the costs of several programs, especially health and welfare costs and possibly judicial costs, will be borne directly by the state. Police and fire services will remain controlled by locally elected officials. Since the former class of services have such explosive growth rates and the level and quality of these services are so variant between locales, it again appears to make good sense for the state to provide state funds for these programs and to assume control over the provision of these services, which are considered by the general public to be the lowest priority program among the major state and local services. Another Proposition 13 irony is that it has hastened the possible reform of health and welfare programs but has reduced the state's capability to fund the solution.

3. Tax Shifts Related to the funding and local control questions raised by Proposition 13 are questions regarding the appropriate revenue sources for these services. There are now at least three major alternatives being considered. The first is a continuation of the local government bail-out (similar to SB 154 of 1978-79) in which the source of support is the General Fund of the state. There appear to be no strong advocates of this approach, but it now looks as if, because of the lack of agreed upon alternatives, this funding

alternative may continue. The Governor advocates a plan which calls for the state assumption of certain county functions and the transfer of what had been county revenue from the local property tax to schools. This would increase the school reliance on property taxes from 30% to 50%. The Sepaker of the Assembly advocates a reduction of school reliances on property taxes from 30% to 20% of their total revenue and a corresponding increase in city and county reliance on property taxation. The rationale for the Speaker's proposal is that where possible, property related services, especially police and fire, should be funded from taxes on property. The Republicans in both houses have coalesced around a plan which would replace the current bail-out mechanism by a redirection of the sales tax revenues. Each of these proposals has its advocates and detractors, but no clear leader has, as yet, emerged. It is quite likely that in spite of the unpopularity of the current bail-out mechanism there will be consensus on the best long range approach and the bail-out will continue.

4. Expenditure Limits The Gann Initiative, if successful, will limit local (as well as state) government growth to the growth in the Consumer Price Index plus population. A major outcome could be to limit city and county development. A city or county may not be able to provide, within the limit, the services needed to support a large housing development or a new industrial complex. As far as revenues are concerned, it is unlikely that given the existing limit on property taxes, local government could realistically expect to receive revenues which would exceed the appropriation limitation. The Gann Initiative will add impetus to the movement to shift certain fast growing costs to the state, especially in health and welfare. Because of the size of the state's total revenue, the state would have greater flexibility to absorb the costs of these programs within its limitation.

C. Schools

School districts and community college districts will become, in the post Proposition 13 era, more and more reliant on the state for revenue. In 1978-79, the state provided about 70% of the districts' total state-local revenue. It is unlikely that percentage will decrease appreciably. The shift of funding source could have a radical impact on the schools of the 80s.

1. Centralized Decision-Making Although California's 1100 plus local school governing boards have a strong tradition of local control, there are signs that concomitant with funding shifts to the state, at least some of the decisions historically left to the boards may shift to the state. Both last year's state budget and this year's proposed budget contain language requiring districts to maintain offerings of certain kinds of classes which had been offered in the prior year. The Legislature, to a higher degree than at any time in the last decade, is making decisions about school curricula and is conditioning the receipt of state dollars on district compliance. Absent a substantial public backlash to the centralization of these decisions, the tendency is unlikely to abate. The state's attempt last year to override already existing collective bargaining agreements and to require a pay freeze was the most glaring case yet of the inclination of the Legislature and the Governor to assume control. If the state cannot resist the temptation to control, and decision-making power is shifted further and further from local constituents, public disenchantment with both the state government and the local schools is likely to grow. A succession of polls in California over a significant period of time have consistently shown that California citizens have more confidence in local governmental officials than they do in either state or federal officials.

2. Serrano As the court imposed date for compliance with the California Supreme Court's decision in Serrano comes perilously close (1980), the Legislature must readdress a problem which was perceived to have been solved with the passage of Assembly Bill 65 of the 1977 session. The Serrano provisions of AB 65 were completely emaciated by Proposition 13 and the Legislature is again faced with an incredible dilemma, which must be sorted out and solved in an all-too-short time frame.

The Serrano suit was based on the notion that assessed value differences between districts led to expenditure differences which were constitutionally impermissible. The passage of 13 virtually reversed the problem. Prior to 13, districts which were low in assessed value per ADA received substantial state funds, whereas districts with high assessed value only received the constitutionally mandated minimum of $120 per ADA. Proposition 13 drastically reduced the revenue of the high assessed value districts - those most reliant on the property tax, but had little effect on low assessed value districts which had never received much revenue from property taxes. Had the state not acted, the formulas in effect at the time would have generated the situation in which all districts would have lost revenue, but the low assessed value districts would have received relatively more revenue than their higher assessed value counterparts - a reversal of the case prior to 13. The Legislature was faced with the awkward situation of providing more money to the higher assessed value districts than to lower wealth districts. Not to do so, would have resulted in the destruction of the high wealth districts.

The plaintiffs in the Serrano suit have taken note of the Legislature's actions and will continue to demand greater Serrano compliance. The larger fiscal role now played by the state argues for increased attention to Serrano and makes the possibility of full state assumption of educational costs at a nearly uniform basic rate, while not yet a "fait accompli", a distinct long term possibility. In the short term, the Legislature will be thrown back into the pre AB 65 Serrano morass of trying to determine the appropriate methodology and speed which should be used to equalize district revenue per ADA. Given the other legislative problems in the post 13 era, an easy solution to Serrano, as modified by 13, appears remote.

3. Expenditure Limits The Gann Initiative, if successful, would do nothing to ease the Serrano compliance burden. It may, in fact, make it appreciably more difficult. If a local school district's revenue is limited to its prior year revenue plus inflation and ADA

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growth, it would be impossible for low expenditure districts to "level-up" their expendiutres to those enjoyed by higher expenditure districts. The only permissible alternative may be to lower the expenditures of high expenditure districts, something which politically is never easy to do.

Next to the *Serrano* problem caused by the Gann Initiative, other school related problems caused by Gann appear less impactful. Schools, unlike other local agencies of government, have already experienced life under revenue limits and the level of the appropriation limit may well exceed the level of district revenue they may reasonably expect. The problem will occur in declining enrollment districts which may be unable to accommodate the losses in revenue generated by losses in ADA by comparable cost reductions. Finally, given several interpretational problems regarding what constitutes a district's base for the purposes of imposing the limit plus problems requiring judicial interpretation, it may be several years and several court decisions before the full impact of the Initiative will be known.

4. *Categorical Aid Programs* With the regular per ADA allocation of funds becoming more and more a state problem, the Legislature will examine more closely than ever before the other major educational expenditures for programs targetted to individual *groups* such as bilingual and economically disadvantaged youth and to individual *programs* like the School Development Program. All programs will be subjected to new standards of effectiveness. The pre 13 luxury of being able to assuage the demands of advocates for special programs by simply providing more dollars is over. The 25 plus categorical aid programs in California will all come under increased scrutiny with programs without large constituencies and without political clout especially vulnerable. A major funding bill this session which has already passed the Assembly, even goes so far as to "sunset" all categorical programs. The competition between regular apportionments and categorical aid dollars has been a virorous one and the impact of Proposition 13 will undoubtedly heighten the controversy. The end result may well be to create increased pressure *within*

dismissed. Again, the initiative process will offer a tempting solution to those who would wish to abolish the tenure system.

An issue that divides teacher and other employee groups and which has been highlighted and exacerbated by Proposition 13, is employee affirmative action. The two largest statewide teacher's associations, the California Teachers Association and the California Federation of Teachers, have been torn by this issue. As teachers get laid off because of program cutbacks, the problem will become worse. Essentially the issue involves the older and more experienced teacher who is a natural advocate for the seniority system. Arrayed on the other side of the issue are the smaller group of younger, less experienced teachers, some of whom favor a system which emphasizes skill and quality of teaching over years in the system and the minority employees recently hired because of an affirmative action program who now find themselves to be among the first group of employees to be let go.

With the new pressures on the seniority and tenure systems will come new pressures to reevaluate California's existing teacher evaluation law, the Stull Act. Thus, virtually every statute relating to the employer-employee relationship in the California schools will be readdressed with all the divisiveness and bitterness that these, among the "hottest" of the political educational issues, engender. The ultimate impact will fragment the educational establishment just at the time its political needs call for a united effort.

Growing frustration will characterize the post 13 era as school board members resent inroads into their historical power by the Legislature and by teacher groups. Teacher morale will continue to erode as threats to tenure and other protective legislation grow. Salary limitations caused by limited revenue will be compounded by the ills that accompany declining enrollment and the teacher community will continue to be split between groups with different priorities regarding job security and performance.

the education community, making it more difficult to achieve the kind of consensus necessary to enact education finance legislation.

5. Personnel Issues Another set of issues impacted by Proposition 13 and bound to create intra-educational disputes, are those issues relating to employees.

Collective bargaining is a relatively new phenomenon in California. After a decade's experience with a "meet and confer" statute, California enacted in 1975 a comprehensive K-14 collective bargaining statute. The passage of 13 has important implications for collective bargaining. First, the reduction in revenues will probably generate increased employee frustration and will lead to a more militant employee stance than would have occurred had more dollars been available. Increased militancy of public employees in the past has led to increased public antipathy toward its employees in California. Labor leaders fear that this attitude, combined with the recent notable success of the initiative process, may lead to the attempted repeal of the collective bargaining sttutes.

Because of decreased revenue flexibility, collective bargaining issues at the local school board level will turn to non "bread and butter" items as teachers attempt to secure greater control over their destinies. Under the existing collective bargaining statute, many of these non "bread and butter" issues are not within the scope of bargaining. Teacher groups will attempt to expand the list of bargainable issues and will be firmly and vigorously opposed by school board and administrative groups. In fact, as revenue becomes more scarce, boards and administrators will seek repeal of many statutory provisions which now grant specified privileges or benefits to employees. School boards will become even more pressured as pressure from the state centrists and the local employees tug and pull at their power and control.

If the increased frustration caused by Jarvis and Gann, et al, leads to public work stoppage, and I think it will, the public may well act on one of its long and most deeply held anti-teacher attitudes - that the tenure system protects incompetents from being

6. Vouchers Perhaps no exterior threat is viewed with greater alarm by the educational establishment than vouchers. Currently, an effort by Jack Coons, professor of law at the University of California's Boalt Hall and an ardent and articulate advocate for vouchers as an alternative, may develop into yet another initiative - that implementing a voucher system. Problems generated by Serrano compliance in high expenditure districts, opposition to mandatory busing, general dissatisfaction with public school performance, disenchantment with teacher quality are enough to cause the public sector to flinch when the word "voucher" is mentioned. The prospect of declining school revenue caused by Proposition 13 and the Gann Initiative materially enhance the chances for a voucher alternative. Increased public dissatisfaction caused by growing factionalism within education will only add to its chances.

7. Fees California, more than any other state, has been committed to virtually free, open access education to its citizens through the 14th grade. Almost every community offers, either in its adult high school program or in its community colleges a wide array of free or low cost educational options. That freedom of chance and choice has been seriously jeopardized by Proposition 13 and the future will see a new reliance on fees, tuition and other charges. The effect, if unchecked, will be to reduce the educational opportunity for low income, minority students. California's tuition-free community colleges and its low tuition University and State University and College system will be forced to reexamine carefully their revenues and priorities. Increased reliance on fees at all three sectors and in adult high school programs is a virtual certainty.

8. Uncertainty If the post Proposition 13 era can be characterized by a single predictable outcome, uncertainty will be the theme. Questions about the health of the state's economy and its ability to maintain growth; the impact of the centralization of political decision-making in Sacramento; the possibility of additional tax cuts and the probability of expenditure or revenue limitation, join with questions regarding the state's political future, and the impact of the 13 mentality on the future elected local and state officials, to paint a picture of such complexity that the only certainty is uncertainty.

For schools, the added unanswered questions regarding Serrano compliance, the future of the voucher, busing, affirmative action, collective bargaining and increased school board and teacher dissatisfaction make for unpredictable times. The interaction of all of these factors increase the uncertainty of any predictable result. Normally, one might predict negative outcomes for a state beset by so many problems and so many unanswered questions. However, the California economy may prove to be, once again, the states's salvation as it gives the citizens of the state necessary time to provide longer range solutions to the most pressing problems.

Many of the problems which led to the passage of Proposition 13 can be tied directly to past governmental excesses. Proposition 13 has already led to, and will continue to cause a reexamination of the state's functions and its priorities, a not unhealthy exercise for any governmental enterprise. In retrospect, one can only wish that the Legislature had been more able to respond in a meaningful way to the demands of its citizens. For the future, one can only hope that the Legislature, against even tougher odds, will respond to the voters in a convincing manner. Failure to do so will lead inexorably to the continued bypass of the legislative process — an alternative which bodes ill for the future of this nation's largest state.

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PRICE INDEXES FOR TEACHERS IN MICHIGAN:
A REPLICATION AND EXTENSION*

I. Introduction

During the last decade, researchers have been vigorously pursuing many of the issues surrounding the elusive concepts of equity in public education. Examples that stand out include the differences between equity for children versus taxpayers, alternative measures of equity, and the effects of school finance reform on equity. One issue that cuts across almost every other dimension of equity is the problem of price differences across districts. Whether the question is measuring equity or designing or evaluating state school finance plans whose purpose is to foster equity, educational inputs measured in dollars (i.e. revenues or expenditures) may not be the appropriate object of concern if price differences across districts permit equal dollars to purchase unequal inputs. Over the past five years, researchers have begun to estimate price differences for educational inputs and this article both replicates some of the previous research and extends it in several ways.

Since this article is intended to build on earlier work on price indexes, it is necessary to point out what part of the price index literature is being used as a foundation.[1] First, while some of the research endeavors have produced a complete price index for all educational inputs (Chambers, 1978a), this research

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[1] Much of the literature refers to these indexes as cost indexes. However, since only one part of cost, that attributed to differences in input prices, is of concern, we prefer the narrower label of price index.

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is limited to price indexes for teachers' salaries. Teachers' salaries comprised 55 percent of operating expenditures and 74 percent of instructional expenditures for one year of our data (1972-73 in Michigan), so that we are focusing on the most important input in terms of size. Furthermore, the methodology developed for teachers can be extended for other salaries. Price indexes for nonsalary items such as transportation and energy are, however, beyond the scope of the paper.

Second, this article is limited to the estimation and computation of a price index for teachers' salaries. No attempt will be made to utilize the index in measuring equity (Berne, Odden, and Stiefel, 1979), determining school district response (Adams, 1979), or structuring a state aid formula (Grubb and Hyman, 1975).

Third, and finally, the price indexes in this article are based on demand and supply equations estimated, simultaneously, using district level data. This follows one distinct line of inquiry in the price index literature (Brazer, 1974; Brazer and Anderson, 1975; Grubb and Hyman, 1975; Kenny, Denslow and Goffman, 1975). However, since it has been pointed out by Grubb and Hyman (1975) that indexes based on this methodology may be highly sensitive to alternative assumptions and specifications, various indexes are estimated and compared throughout this article. An alternative line of inquiry in the price index literature has been to utilize individual level data and hedonic price theory (Chambers et al, 1976; Chambers, 1978a; and Wendling, 1979). The benefits of this approach include fewer identification problems, simpler estimation techniques, and better data on certain aspects of quality and the classroom setting. But, compared to the data utilized in the district level approaches, in most states the individual level data collection and assembly costs are higher. Of course, further research must continue to use individual level data and eventually compare the resulting indexes to those computed using district level data. However, until one methodology is shown to be preferable or cost-effective, research on district level data needs to proceed as well.

The remainder of the article is organized in five sections. Section II replicates the price index for teachers' salaries originally calculated by Brazer and Anderson (1975) for Michigan using 1972-73 data. In this section, Brazer and Anderson's original index is compared to a similarly specified index based on almost all the Michigan districts, rather than the one-third originally examined by Brazer and Anderson. In Section III, the sensitivity of the Brazer-Anderson index is tested by altering the specifications utilized to estimate the index. Two additional indexes are calculated in this section and compared to those estimated in the previous section. The dependent variable employed in all the analyses carried out in Sections II and III is average teachers' salaries in the district. In Section IV, similarly specified indexes are estimated using specific points on each district's salary scale as the dependent variable. The starting salary for a BA with no experience and an MA with no experience are used to compute price indexes that are compared to the indexes estimated using average salaries. In Section V, the indexes estimated in Sections II and III are re-estimated using data from 1975-76. Thus indexes based on alternative independent variables, dependent variables, and time periods are estimated for all Michigan school districts. The methodological and policy relevant conclusions that follow from this analysis are spelled out in Section VI.

II. The Brazer-Anderson Index for All Michigan School Districts

In the 1975 Selected Papers, Harvey Brazer and Ann Anderson estimated a price index for 173 Michigan school districts based on a competitive market, demand-supply model for teachers' services.[2] They briefly considered other models that assumed less than perfect competition due to bargaining or that included two teacher quality variables (average years teaching experience and percent teachers with masters degrees) as endogenous. Brazer and Anderson rejected the bargaining models because they were too complex to estimate. They also rejected the use of endogenous teacher quality variables, as measured in their data base, because the prevalence of negotiated salary schedules and tenure rules were thought to remove the determination of these quality variables from the school district's control.

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[2] They also estimated a price index for all inputs, but in this paper we limit ourselves to indexes based on teacher salaries only. The Brazer-Anderson approach to inputs other than teachers was much less sophisticated than their teacher index (mostly due to data limitations). It probably needs more development rather than replication.

The logic of the Brazer-Anderson price index calculation was the following. School districts must spend differing amounts to hire an identical number of constant quality teachers because the supply schedule of teachers differs across districts. Supply schedules differ not in their parameters, but in the values of the exogenous variables affecting supply. In order to develop a price index that represents the relative purchase price of constant quality teachers, the estimated supply schedule of each district can be used to predict the differences from average salaries in the state that a district must pay, given the values of exogenous variables not under the district's control. These uncontrollable differences from average salaries can than be compared to the statewide average salary to form an index whose value centers on 1.0. An unbiased estimate of supply equation parameters is essential to the procedure and thus the need for a demand-supply model and the use of two stage least squares for estimation purposes.

Brazer and Anderson estimated their model using 1972-73 data for 173 Michigan school districts, less than 35% of the approximately 530 K-12 districts. The 173 districts were representative of Michigan K-12 districts along many dimensions and the regression model does not require a random sample for estimation purposes. Nevertheless, if indexes such as the Brazer-Anderson one are to be used in state policy, it is likely that state policymakers will want to know the sensitivity of the index to the number of districts used for estimation. Also of interest are the values of the index for the districts not included in the 173 school district sample. In this section of the paper, we briefly review the Brazer-Anderson demand-supply theory. Their model is reestimated using data from approximately 500 Michigan school districts and the resulting two-stage regression coefficients are compared to the ones estimated by Brazer and Anderson. Then a price index is calculated based on the new regression results for the supply equation but using the Brazer-Anderson assumptions on uncontrollable variables. Finally this new index is compared to the original Brazer-Anderson one in order to determine the differences between an index estimated on a sample versus one estimated on the population of school districts.

The Brazer-Anderson (B-A) Theory

The B-A model is a straightforward demand-supply model, with the addition of an extra endogenous variable meant to capture the simultaneity of the salary determination and school budgeting processes. The three endogenous variables are average teacher salary (ATS), the number of teachers employed per thousand students (TPUP), and school district millage rate that is voted on top of an unvoted basic millage allocated by the county to the school district (MILLV). The MILLV variable is the additional budget-process endogenous variable.

The demand equation for teachers, with ATS as the dependent variable, is a function of three groups of variables: the endogenous variables, TPUP and MILLV; community taste or preference variables; and variables related to ability or capacity to support education.

1. The endogenous variables: B-A hypothesize the usual downward sloping demand curve, and thus expect the coefficient on TPUP to be negative. The coefficient on MILLV is expected to be positive because MILLV is included as an indication of a community's willingness to support education.

2. Preferences or taste variables: Four variables are included to represent the school district's preferences or taste for education. These variables, along with the predicted sign of their coefficient, are the following:

PPUPOP(+) proportion of population that is public school pupils;

PFOR(+) proportion of the population who were born abroad or had parents born abroad in 1970;

MOB(+) percent of the population aged five and over who lived in the same house in 1970 as in 1965;

PCOL(+) percent of the adult population who attended one or more years of college in 1970.

3. Ability or capacity variables: Five variables are used to measure ability or capacity to support education. These variables, with the predicted sign of their coefficients, are the following:

PRICH(+) percent of families with 1969 income equal to or greater than $15,000,

SEVP(+) 1972-73 state equalized property wealth per pupil in thousands of dollars,

RES(-) percent of property wealth accounted for by residential property;

REVPL(-) proportion of total local district general revenue provided by local sources in 1972-73;

TAXO(-) total non-school tax levy imposed on property in the district.

We were able to replicate all of the variables, except TAXO. Appendix 1 to this paper gives the source for each variable included in our replication of B-A's model, as well as for variables included in models reported later in the paper.

The B-A supply model postulates that ATS is a function of one endogenous variable (TPUP) and four sets of exogenous variables: teachers' experience and education; characteristics of pupils and schools in the district; characteristics of the community; and measures of union strength.

1. The endogenous variables: Since the B-A model is a competitive one, the supply curve of labor is postulated to be perfectly elastic for each district and the coefficient on TPUP is expected to have a coefficient not significantly different from zero.

2. Teacher quality variables: The two variables available to measure teacher quality are ones built into the salary schedule:

AYTE(+) average years of teaching experience for the districts' teachers in 1972-73;

PTECM(+) percent of teachers holding Masters' degrees or higher in 1972-73.

3. Pupil or school characteristics: To measure pupil or school characteristics the following three variables were included:

LIOPUP(+) base 10 logarithm of the number of pupils in 1972-73;

SKCF(-) a measure of fourth grade achievement on a test of basic skills;

PMALES(+) percent of teachers who are male in 1972-73.

4. Community characteristics: B-A gathered six variables to represent community characteristics:

CE(+) central city; RUR(?) rural area; SUB(?) suburb; IND(?) independent city (the control type);

PNW(+) percent of the population in the district that is minority in 1969;

MFY(+) median family income in district in 1969;

DENS(+) population density in the county in 1970;

MLEMP(+) average earning of employed males, aged 16 and over in the county in 1969;

PCOL(-) proportion of the population who attended one or more years of college in 1970.

5. Unionization variables: Two unionization variables are included in the supply equation:

STRK(+) number of days teachers in district were on strike during three years, 1970 to 1972;

CONTRCT(+) presence (1) or absence (0) of an agency shop and binding arbitration in 1973-74.

Reestimation of the B-A Specification With 469 School Districts

We used two-stage least squares to reestimate the B-A model, with 469 Michigan K-12 school districts for the 1972-73 school year. Approximately 60 districts in existence in 1972-73 were omitted due to lack of data on at least one variable. The estimated demand and supply equations are presented in Tables 1a and 1b, along with B-A's estimated results. Variables with no dates are for a calendar year, usually 1970, while those with a 73 following their mnemonic are from the 1972-73 school year. The results of the two estimations are very similar. Almost all the variables have the same sign and similar magnitude; with one or two exceptions the (asymptotically) significant variables are the same. While the results are not necessarily surprising given that regression analysis does not require a random sample for good estimation, still it is reassuring to confirm that estimations with a sample representative of the state and with nearly all districts in the state yield similar results. We do not report an R^2 with our estimate, since two stage least squares does not readily lead to an R^2 calculation. However, for those who are willing to define an R^2 as equal to $1 - \frac{\text{SEE (from a 2 stage equation)}}{\text{SST (from a reduced form equation)}}$, the inputs to this calculation are given at the bottom of the table.

Calculation of a Price Index Using the Reestimated Supply Equation

A price index that is constructed from an estimated teacher supply equation is meant to indicate differences in the price of constant quality teachers due

Table 1a

TSLS ESTIMATES OF DEMAND EQUATION FOR AVERAGE TEACHERS SALARIES (ATS73) IN 469 MICHIGAN SCHOOL DISTRICTS FOR 1972-73 USING B-A SPECIFICATION

	Reestimated B-A Specification		From B-A (1975)	
Variable	Regression Coefficient	't' Statistic	Regression Coefficient	't' Statistic
INTERCEPT	19260.	11.83	15517.	5.75
TPUP73*	-303.1	-7.90	-294.4	-5.18
MILLV73*	339.1	5.59	387.1	7.44
PCOL	9.815	.70	52.68	2.46
PPUPOP73	149.4	.09	6927.	1.89
PFOR	3936.	3.90	3332.	1.90
MOB	-7.415	-.68	24.12	1.54
PRICH	-6.453	-.57	-28.10	-1.58
SEVP73	169.1	4.94	305.1	6.76
REVPL73	-6076.	-3.25	-11630	-.93
RES	-15.58	-3.08	-8.720	-4.67

SST(ATS) = 767,798,260

SSE(Equation) = 954,053,184

*Endogenous variable

Table 1b

TSLS ESTIMATES OF SUPPLY EQUATION FOR AVERAGE TEACHERS SALARIES IN 469 MICHIGAN SCHOOL DISTRICTS FOR 1972-73 USING B-A SPECIFI

	Reestimated B-A Specification		From B-A (1975)	
Variable	Regression Coefficient	't' Statistic	Regression Coefficient	't' Statistic
INTERCEPT	1918.	1.42	-591.6	-.20
TPUP73*	13.76	.66	53.87	1.50
AYTE73	181.8	11.44	193.9	4.49
PTECM73	21.09	5.23	33.22	3.31
LIOPUP73	882.6	4.69	813.2	2.65
SKCF	4.872	.35	-1.152	-.03
PMALES73	17.68	3.73	31.40	2.08
CC	301.6	1.49	462.8	1.29
RUR	-41.61	-.29	-184.6	-.67
SUB	76.26	.60	-59.5	-.22
PMW	10.92	2.00	-1.663	-.16
MFY	.0620	2.35	.0967	1.89
DENS	.2406	7.14	.1805	2.74
MLEMP	.2210	5.56	.2286	2.37
PCOL	2.604	.49	-28.73	-1.94
STRIKE	-14.89	-1.30	30.17	1.98
CONTRACT	214.5	4.02	361.6	2.11

SST(ATS) = 767,798,260

SSE(Equation) = 124,591,912

*Endogenous variable

to variables that are not under a district's control. The mechanics of the construction of such an index for any district, j, involve the following calculations:

$$\text{Index}_j = \frac{\overline{ATS} + \sum_{i=1}^{n} b_i(X_{ij} - \overline{X}_i)}{\overline{ATS}},$$

where $\overline{ATS}$ is the mean value of ATS for all distircts included in the index, b_i is the estimated regression coefficient for each variable in the supply equation not under the school district's control, X_{ij} is the actual value of variable i in the j^{th} district, and $\overline{X}_i$ is the mean value of variable i for all districts.[3]

The choice of which supply variables are not under the district's control is crucial. In this section, we replicate the B-A choices, using the coefficients from our reestimated equation. The variables selected as uncontrollable by B-A are: AYTE, PTECM, LPUP, SKCF, CE, RUR, SUB, DENS, MLEMP, PCOL. Five variables were counted as controllable, mostly for policy reasons. For example, B-A argue that it would be poor policy to assign a higher index to districts that had more strike days because of the perverse bargaining incentives. Likewise, few policymakers would be comfortable assigning a higher index to districts that hired proportionately more males. While these choices can be debated, the most controversial choice is the inclusion of the quality variables, ATYE and PTECM, as uncontrollable. However B-A are consistent in their argument about these variables, since they made the variables exogenous rather than endogenous in their estimation procedure.

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3. There are alternative ways to calculate an index from a regression equation. They vary depending on assumptions made about the controllability of the unexplained variation in the supply equation. B-A present a discussion of the alternatives (1975) which we do not repeat here. We followed the B-A procedure and assume the residual is controllable.

The original B-A index based on 173 districts and our reestimated index based on 505 districts are compared in two different ways.[4] First, six districts from various parts of the state are chosen for comparison. Throughout this paper, these same six districts will be used. Second, the Pearson correlation coefficient between indexes is analyzed. Below are the calculated indexes for six districts, based on the original B-A estimation (INDEXB) and on our reestimation (INDEX1). While these six districts were chosen from different areas of the state, they are not necessarily representative of other districts in those areas. The six are used only to give concrete examples of what the index calculations look like in specific cases.

School District	School District Number	INDEXB	INDEX1
Detroit (CE)	82010	1.274	1.383
Birmingham (SUB)	63010	1.062	1.255
Kalamazoo (CE)	39010	1.127	1.174
Cheboygan (IND)	16015	1.005	1.004
Marquette (IND)	52170	.963	1.053
Kingsley Area (RUR)	28090	.818	.850
Mean for entire sample of districts		1.000	1.000
Range for entire sample of districts		(.767; 1.275)	(.798; 1.383)
Standard deviation for entire sample of districts		.095	.095

Appendix 3 contains a list of the calculated indexes, where available, for each school district in the state. The school district number is a coding number, where the first two digits represent the county and the last three the school district within that county. Both indexes have a mean value of 1.000, and a standard deviation of .095, but differ slightly in their ranges, with INDEX1 covering a greater range and having a longer tail at the high end.

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[4] Note that the price index is computed for a slightly larger sample (505) than the sample utilized for the two stage least squares regressions (469). For the regressions, districts are omitted if one of the variables in the specification is missing. Districts were omitted from the calculation of the price index only if one of the variables in the price index is missing. The robustness of the regressions for widely varying sample sizes provides a justification for including districts in the price index that are not in the regression. A similar procedure is used throughout the paper.

Detroit is very near or at the top end of both indexes, while the upper peninsula and upper part of the lower peninsula districts, Marquette and Cheboygan, are close to the mean. The Detroit suburb, Birmingham, is ranked differently by the two indexes - close to the mean on INDEXB and relatively high on INDEX1. The medium sized city of Kalamazoo, in southwestern Michigan, is somewhat above the mean and the rural districts, Kingsley Area, in the northwestern part of the lower peninsula, is substantially below the mean. While both indexes rank Detroit highest and Kingsley Area lowest, the rankings of the other four districts are somewhat different.

Looking at six districts cannot, of course, tell us systematically what is happening with all districts. For an analysis of all districts, we turn to the correlation coefficients. The Pearson correlation coefficients between indexes are displayed in Table 2. The table shows the correlations between all the indexes discussed in this paper and will be referred to , as appropriate, in following sections. INDEXB and INDEX1 are correlated .927, very highly on an absolute scale as well as relative to other correlations in the table.

Based on the analysis of the coefficients of the estimated structural equations, as well as the calculation of the indexes, we conclude that a price index for Michigan school districts, estimated with a representative sample of districts versus one estimated with nearly all districts, yields very comparable results.

III. Alternative Formulation of the Demand-Supply Model

To a certain extent, the B-A choices about endogenous variables and about appropriate variables to represent types of exogenous factors such as tastes or

Table 2

CORRELATIONS AMONG ALTERNATIVE PRICE INDEXES FOR MICHIGAN SCHOOL DISTRICTS*

	INDEX1	INDEX2	INDEX3	BRSBA	LBSBA	BRSMA	LBSMA	UINDEX1	UINDEX2	UINDEX3
INDEXB	.927 (173)	.657 (173)	.892 (173)	.808 (173)	.728 (173)	.799 (173)	.713 (173)	.889 (173)	.673 (173)	.859 (173)
INDEX1		.788 (505)	.972 (505)	.894 (505)	.801 (505)	.890 (505)	.784 (505)	.964 (505)	.787 (505)	.938 (505)
INDEX2			.833 (528)	.867 (507)	.939 (530)	.846 (507)	.854 (530)	.817 (507)	.978 (530)	.858 (530)
INDEX3				.845 (505)	.819 (528)	.839 (505)	.800 (528)	.942 (505)	.816 (528)	.950 (528)
BRSBA					.907 (507)	.998 (507)	.890 (507)	.914 (507)	.890 (507)	.873 (507)
LBSBA						.892 (507)	.958 (530)	.830 (507)	.951 (530)	.859 (530)
BRSMA							.887 (507)	.913 (507)	.873 (507)	.868 (507)
LBSMA								.814 (507)	.874 (530)	.831 (530)
UINDEX1									.826 (507)	.981 (507)
UINDEX2										.865 (530)

*The number of districts included in correlations is in parentheses. The number is the lower of the numbers included in either index.

school and pupil characteristics are arbitrary. From a policy perspective, it is desirable that slight modifications in theory, especially ones about which researchers might debate, have little effect on the final price index. In order to test the robustness of the Michigan price index to slight differences in theory, we briefly develop some alternative specifications of the demand-supply model for teachers' services. We then use two-stage least squares to estimate the reformulated specification and compare the results to our reestimated version of the original B-A specification. Finally two price indexes based on the reformulated specification are calculated and compared to the B-A indexes.

Reformulated Demand-Supply Theory

B-A include three endogenous variables in their model. The first two (salaries, ATS, teacher/pupil ratio, TPUP[5]) are specifications of the usual price and quantity variables essential to any demand and supply model. The third, extra voted mill rate, MILLV, is an attempt to build into the model the public budgeting context in which the market for public school teachers operates. While the budgeting context is important and ideally a full fledged model of financial decision making in school districts should be constructed,[6] the inclusion of an endogenous MILLV variable seems grossly inadequate to the task. We choose to simplify the model as much as possible and do not see much loss from elimination of MILLV in the reformulated model.

In the reformulated demand equation, with ATS as the dependent variable, we follow B-A with the use of three sets of variables: the endogenous TPUP with an expected negative sign; community taste or preference variables; and variables representing ability or capacity to support education. In addition we include a variable, the number of school districts per square mile in the county (DISSMC), which we use as a proxy for degree of competition among districts and expect to have a positive coefficient.[7] The community taste variables are similar to B-A's, with the exception that we omit MOB and include PMALES. The ability to support education variables are somewhat different from B-A's. While we continue to include SEVP and RES as they did, we add four new variables in place of PRICH and REVPL. These are median family income (MFY), change in per capita income between 1970 and 1973 (CHIN7073), state aid per pupil (STDIPP),and federal aid per pupil (TTFDPP). We think these variables represent well the income of a district and the intergovernmental aid available to it. We expect positive coefficients on all four variables.

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[5] See Brazer and Anderson (1975) for a discussion of why the quantity variable is a ratio of teachers to pupils rather than just number of teachers.

[6] See Robert Inman (1979) for a perceptive summary of the state of the art in public expenditure and budgeting models.

The specified supply equation uses the same types of variables as did B-A, but with different choices to represent pupil and school characteristics, and community characterisitcs. For lack of a better alternative, AYTE and PTECM again measure quality. For the pupil and school characteristics, we make the following modifications to the B-A model. The number of pupils (PUP) and the square of the number of pupils (PUPSQ) substitute for the logarithm of the number of pupils (LIOPUP). The percent of pupils classified as special education (SPED) substitutes for SKCF, with an expected positive sign. Finally, the number of noninstructional professionals per pupil (PRPUP) is used to represent desirable working conditions within a school and a negative sign is predicted. Community characteristics are measured by a slightly different group of variables than those identified by B-A. The location variables are changed to coincide with distinct areas in the state: districts in the upper peninsula (UP), districts in the northern part of the lower peninsula (CENT), districts in the Detroit SMSA (METRO), and the control group of districts in the southern part of the lower

7. See Jay Chambers (1978b), for a rationale for use of such a variable.

peninsula, but not in the Detroit SMSA (OTHER). MLEMP and PNW are included as before, but MFY and PCOL are omitted because they seem to us to be more appropriately classified as demand variables. Finally DISSMC is substituted for DENS. While the two measure different things (degree of competition versus congestion), they are highly correlated and are difficult to use together.

Estimation of the Respecified Model

The two stage estimates of coefficients and asymptotic t values are presented in Tables 3a and 3b. The years in which the data were collected are once again either the calendar year, 1970, or the school year, 1972-73,and 470 K-12 districts have complete data for all variables. For the variables that are the same between the respecified model and the reestimated B-A model (Table 1a and 1b), the coefficients are essentially in agreement as to magnitude and sign, except for PPUPOP in the demand equations. In the respecified demand model (Table 3a), PPUPOP has a large negative sign while in the reestimated B-A model (Table 1a), it has a positive sign. The t value in the respecified model is high, but should be interpreted with caution. We have used the same data base to estimate several different equations, so that the assumptions of classical hypothesis testing no longer hold. We expected PPUPOP to have a positive sign. One possible explanation for the negative sign is that the variable may represent both a taste and a cost factor. On the cost side, a larger ratio of pupils to population means that constant expenditures per pupil cost the adults more per capita than in a district with a low ratio. Districts with high ratios may opt for lower per pupil expenditures, which in turn translate into lower salaries. While a plausible explanation, the shift in sign and the large negative magnitude means we cannot be confident about the variable's effect.

Other variables that we added to the demand equation met with fairly good success. MFY, CHIN, STDIPP and TTFDPP all have the correct, positive sign and three of the four have high t values.

Table 3a

TSLS ESTIMATES OF DEMAND EQUATIONS FOR AVERAGE TEACHERS SALARY (ATS73) IN 470 MICHIGAN SCHOOL DISTRICTS IN 1972-73 USING REFORMULATED SPECIFICATION

Variable	Regression Coefficient	't' Statistic
INTERCEPT	13223.	10.42
TPUP73*	-168.8	-7.49
PCOL	18.14	2.32
PPUPOP73	-4896.	-5.44
PFOR	2069.	3.15
PMALES73	23.97	2.84
DISSMC	24869.	5.31
SEVP73	37.54	2.38
RES	-2.60	-.83
MFY	.2211	6.10
CHIN7073	6117.	2.74
STDIPP73	.0674	.06
TTFDPP73	7.609	5.52

SST(ATS) = 770,358,127

SSE(Equation) = 375,422,051

*Endogenous Variable

Table 3b

TSLS ESTIMATES OF SUPPLY EQUATIONS FOR AVERAGE TEACHERS SALARY (ATS73) IN 470 MICHIGAN SCHOOL DISTRICTS IN 1972-73 USING REFORMULATED SPECIFICATION

Variable	Regression Coefficient	't' Statistic
INTERCEPT	4264	4.76
TPUP73*	42.57	2.19
AYTE73	192.3	11.10
PTCEM73	31.86	8.34
PUP73	.0611	7.08
PUPSQ73	$.21\text{X}10^{-6}$	-7.03
SPED73	6942.	2.04
PRPUP73	-13.33	-2.14
PMALES73	5.316	.93
DISSMC	14812.	3.67
METRO	379.7	2.38
UP	-74.45	-.53
CENT	-17.81	-.15
PNW	10.20	1.85
MLEMP	.2383	5.87
CONTRACT	268.3	4.34

SST(ATS) = 770,358,127

SSE(Equation) = 163,836,050

*Endogenous variable

The supply equation (Table 3b) is also successful in terms of predicted signs of coefficients. SPED has a large positive coefficient and a high t compared to the coefficient of the variable it substituted for, SKCF, in the B-A reestimation. PRPUP has the expected negative sign, the PUP and PUPSQ variables perform as well as LIOPUP, DISSMC is an adequate substitute for DENS, and we obtain the same mixed results on the location variables as did B-A, with METRO having a large positive coefficient.

Price Indexes Based on the Respecified Model

While the differences in the sturctural equations are interesting, the critical question for policy purposes is how much difference in price indexes results from the use of alternative equation specifications. In addition to testing the sensitivity of the index to the equation specification, we will also look at changes in the index that result from alternative assumptions about whether the two quality variables, ATYE and PTECM, are uncontrollable.

Two new indexes are calculated, using the estimated supply equation coefficients presented in Table 3b. The indexes differ only in terms of whether the two quality variables are included as uncontrollable. INDEX2 specifices the following variables as uncontrollable: UP, METRO, CENT, MLEMP, PNW, PUP, PUPSQ, SPED, DISSMC. INDEX3 includes these variables plus AYTE and PTECM.

The values for the six example school districts are shown below:

School District	School District Number	INDEX2	INDEX3
Detroit (CE)	82010	1.103	1.227
Birmingham (SUB)	63010	1.166	1.321
Kalamazoo (IND)	39010	1.066	1.175
Cheboygan (IND)	16015	.953	.976
Marquette (IND)	52170	.961	1.025
Kingsley Area (RUR)	28090	.966	.861
Mean for entire sample		1.000	1.000
Range for entire sample		(.890; 1.259)	(.786; 1.427)
Standard deviation for entire sample		.068	.102

INDEX2 and INDEX3 do not both rank Detroit highest nor Kingsley Area lowest, as did INDEX1 and INDEXB. Instead, Birmingham is highest on both, Detroit second, and Kalamazoo third. The fourth, fifth and sixth positions shift among the districts depending on which index is used. The range and standard deviations for INDEX3 are considerably higher than those for INDEX2. This might be the expected result because AYTE and PTECM are assumed uncontrollable for INDEX3 and these two variables have large coefficients in the supply equation as well as relatively large variances in the sample.

The correlations using all districts for which data are available are shown in Table 2. INDEX1 and INDEX3, which are highly correlated at .972, differ in terms of variables used in the estimating equations; however, the two indexes both include AYTE and PTECM as uncontrollable. INDEX2 and INDEX3 on the other hand show a lower correlation of .833. These two indexes use the same estimated equation, but in INDEX2, ATYE and PTECM are assumed to be under the control of the school district. Assumptions about whether quality is controllable make more of a difference for these Michigan districts than do decisions about which variables to include in the estimated equation. When both the estimated equations and the controllability of AYTE and PTECM are varied (INDEX1 and INDEX2), the correlation coefficient falls even lower, to .788.

One conclusion to be drawn from this section is that marginal changes in equation specification make little difference in the index calculations, but decisions about the controllability of the quality variable have an impact on the variation in the index as well as on the agreement between the indexes.

IV. Alternative Price Indexes Utilizing Starting Salaries

The two price indexes calculated in the previous section each employed different assumptions regarding the two teacher "quality" variables, average years of teaching experience (AYTE) and percentage of teachers with degrees at the Masters level and beyond (PTECM). AYTE and PTECM were assumed to be under the control of the school district and reflective of quality in the formulation of INDEX2. In INDEX3, however, AYTE and PTECM were considered part of the administered salary schedule and, as a result, largely beyond the control of the individual school district. Following through on these assumptions, INDEX3 includes AYTE and PTECM in the calculation of the index, while they are excluded from the calculation of INDEX2. The results in Section III showed that although the ranges and standard deviations in the indexes are somewhat affected by the alternative assumptions, the correlation between the two indexes is still relatively high.

In this section an alternative strategy to embody the assumptions incorporated in INDEX2 is utilized to calculate four different price indexes. Note that the supply equation used to estimate INDEX2 (and INDEX3) included AYTE and PTCEM as independent variables since both variables are hypothesized to affect *average* teachers' salaries in the district. However, a different way to take the structure of the salary schedule into account, without using AYTE and PTECM as independent variables in the supply equation, is to estimate both the supply and demand equation for an identical point in each district's salary schedule. Once a fixed point in the salary schedule (such as starting salary for a BA) is used as the dependent variable, there is no need to use AYTE and PTECM as independent variables in the supply equation. Equally as important, there is no choice in the treatment of AYTE and PTECM in the construction of the index. They are not in the regression estimates and therefore are not included in the index. This is consistent with the assumption that AYTE and PTECM are quality variables that are controllable by the school district, the same assumption embodied in INDEX2.[8]

Two dependent variables representing different points on the salary schedule, were obtained from Michigan Education Association reports for Michigan districts in 1973-74. The first is the starting salary for BA's with no experience (SBA) and the second is the starting salary for MA's with no experience (SMA). Both SBA and SMA are used as dependent variables in demand-supply models utilizing the Brazer-Anderson specification described in Section II and the reformulated specification described in Section III. Specification wise, the only difference is that neither AYTE nor PTECM is included in the regressions estimated in this section. After the equations are estimated utilizing the same data for the independent variables described in Sections II and III, the supply curve is used to calculate price indexes and these indexes are compared to the ones estimated previously.

Before the actual price indexes are discussed, however, a few comments on the estimated regressions are in order. Appendix Tables 2.1a through 2.1d display the demand and supply equations for the B-A specification and the reformulated specification, respectively, all with SMA as the dependent variable. (The regressions with SBA as the dependent variable strongly resemble those shown in the Appendix.) The demand equation for SMA using the B-A specification (Appendix Table 2.1a) performs similarly to the B-A specified demand equation for ATS (Table 1a). The same six variables in both have t values over two. The supply equation for SMA using the B-A specification (Appendix Table 2.1b) does not perform as well as the comparable equation for ATS (Table 1b). Three variables (PMALES, PNW, and MLEMP) with t values over two for ATS have t values under one for SMA. Neither the demand nor the supply equation for SMA using the reformulated specification (Appendix Tables 2.1c and 2.1d) have as many significant variables as the equivalent equations for ATS (Tables 3a and 3b). Finally, in both specifications of the supply equation for SMA, the coefficients on almost all variables are smaller in magnitude than those for ATS. Although there are differences in the regression results, a more important question is whether these differences affect the price indexes.

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[8] If AYTE and PTECM are assumed to be controllable by the school district, then an additional alternative strategy would be to treat AYTE and PTECM as endogenous variables in the models with ATS as the dependent variable. However, since Brazer and Anderson tried this without success, it is not replicated in this article.

Price Indexes With SBA and SMA as Dependent Variables

The two dependent variables and two specifications yield four price indexes that are labelled as follows:

		Specification	
		B-A	Respecified
Dependent Variable	SBA	BRSBA	LBSBA
	SMA	BRSMA	LBSMA

These four indexes are computed identically to those that use ATS as the dependent variable. The only difference occurs because AYTE and PTECM are not used in the regressions nor in the subsequent indexes using SBA and SMA. A comparison of these four indexes with those based on ATS could yield two types of differences. First, the SBA and SMA indexes could be uncorrelated with those produced by ATS. Given our demand-supply theory, if the indexes are uncorrelated it would indicate that there is some process at work that is not well represented in the theory or captured by the available data. That is, from what is known, the expectation is that the indexes will be highly correlated. Second, the magnitude of the price variation reflected in the SBA and SMA indexes may be different compared to the ATS indexes. In fact, since the SBA and SMA indexes assume that AYTE and PTECM are quality variables that should not be reflected in the price index, it is expected that the SBA and SMA indexes will have a smaller price variation than the ATS indexes. The indexes for the six districts and the correlation matrix can be examined to assess both these expectations.

School District	School District Number	BRSBA	BRSMA	LBSBA	LBSMA
Detroit (CE)	82010	1.125	1.160	1.116	1.139
Birmingham (SUB)	63010	1.028	1.036	1.050	1.042
Kalamazoo (CE)	39010	1.037	1.044	1.040	1.043
Cheboygan (IND)	16015	1.000	1.002	.972	.980
Marquette (IND)	52170	1.004	1.008	.984	.993
Kingsley Area (RUR)	28090	.975	.967	.975	.974
Mean for entire sample		1.001	1.001	1.001	1.001
Range for entire sample		(.955;1.125)	(.945;1.160)	(.954;1.128)	(.960;1.159)
Standard deviation for entire sample		.026	.035	.030	.031

The individual indexes for the six selected districts as well as certain summary statistics for all districts in the sample, shown above, confirm the second expectation. The range and standard deviation of the SBA and SMA indexes are substantially smaller than those for the indexes based on ATS (INDEX1, INDEX2, and INDEX3). Specifically, the standard deviations for the ATS indexes are two to three times greater than those shown above.

For these six districts, the overall pattern for the ATS, SMA and SBA indexes is relatively consistent. At a general level, Detroit, Birmingham and Kalamazoo are consistently above the mean, Cheboygan and Marquette around the mean, and Kingsley Area below the mean. However, certain disagreements can be found for individual pairs of districts (e.g. Detroit and Birmingham) when the ATS indexes are compared to the SBA and SMA indexes.

A more complete comparison among the indexes can be obtained from the correlation coefficients displayed in Table 2. The level of agreement between the ATS indexes and the SBA and SMA indexes is generally high, with ten of twelve correlation coefficients ranging from .8 to .9. The intercorrelation among the SBA and SMA indexes alone are even higher, ranging from .887 to .998. Finally, note that the correlation between INDEX2 and each of the four SBA and SMA indexes is always higher than the correlation between INDEX3 with the same SBA and SMA index, again illustrating the effect of a similar treatment of the "quality" variables.

The analysis in this section has shown that utilizing fixed points in the salary schedule rather than average teachers' salaries has some effect on the magnitude of the price differences inferred from the price index. More specifically, the indexes using SBA and SMA as dependent variables yield price differences only one-third to one-half as large as the indexes that use ATS. However, the choice of SBA or SMA versus ATS does not greatly influence the agreement in the price indexes for the individual districts as evidenced by the high correlations among the indexes. Of all the specification differences considered thus far, the assumptions regarding teacher quality stand out as most important.

V. Update From 1972-73 to 1975-76 of B-A and Reformulated Specifications

A final issue relevant to the use of price indexes in state finance plans is the sensitivity of the indexes to the updating of the data upon which they are estimated and calculated. In this section, we use 1975-76 data, where available, to reestimate the B-A specification and our reformulated specification. Then the indexes calculated on the basis of the updated supply equations are compared to the 1972-73 indexes.

The Demand and Supply Equations With 1975-76 Data

The updated B-A specification is displayed in Appendix 2, Tables 2.2a and 2.2b. Variables that have been updated are identifiable by the 76 that follows their mnemonmic (e.g. TPUP76). A comparison of Appendix Tables 2.2a and 2.2b with text tables 1a and 1b, where the same equation is estimated with 1972-73 data, shows that there are not major changes. While several variables change signs, only one of them (PCOL in the 1975-76 equation) has a t value over 2 in either equation. A comparison of the reformulated specification for 1975-76, displayed in Appendix Tables 2.2c and 2.2d, with the same equation for 1972-73 (Text Tables 3a and 3b), also shows consistent results. Only one variable changes sign, and only four have t values that move from values of under 2 to values over 2.

Cost Indexes Based on 1975-76 Supply Equations

Given the similarity in results for the estimated structural supply equations based on 1972-73 and 1975-76 data, we would expect the price indexes calculated from the different equations to be very similar as well. A look at the correlations in Table 2 confirms this expectation. The updated 1975-76 indexes are labelled with a "U" for "update" before their names. Thus UINDEX1 is calculated the same as INDEX1, except it is based on the 1975-76 supply equation. INDEX1, INDEX2 and INDEX3 are correlated with their respective updates .950 or higher. The updated indexes are correlated to one another in the expected pattern: the highest correlation (.981) is between the two indexes that assume the quality variables are uncontrollable and the lowest correlation (.826) is between the two indexes that make different assumptions about controllability of quality and are based on different specifications of the supply equation. The results of this section show that the Michigan price indexes for teachers' salaries are insensitive to updating over a three-year period.

VI. Conclusions

It is still an open question whether or not econometrically estimated price indexes will become an accepted component of state school finance plans. Florida broke new ground by recognizing price differences in their state aid plan. However the Florida index follows a market basket, rather than econometric, approach. New York State's Task Force on Equity and Excellence in Education whose mandate is to look (again) at New York's school finance system in the wake of Levittown v. Nyquist has also considered the price difference issue. The Task Force has accepted the legitimacy of price differences and has had its researchers estimate an econometric, individually based, index. Furthermore, the price index is being used by the Task Force in equity assessments and alternative formula simulations. But it will be some time before the Task Force's final recommendations are put forward, and it is unclear whether these recommendations will be accepted by the legislators. While these two examples show that price indexes may, potentially, be used by state level policymakers, their uniqueness emphasizes that there are still many research questions that are unanswered.

This article has built upon existing price index research to begin to address some of the issues that need careful attention before policy implementation is feasible. First, it was demonstrated that an index based on a representative sample of districts is, in fact, almost identical to a similarly specified index utilizing virtually all districts in a state. This suggests that initial research in a state can proceed with a sample of districts and focus on numerous specifications prior to selecting a single index for the entire state with some savings in data collection costs.

Second, this article has shed some light on the question of alternative specifications. Within the demand-supply framework used explicitly by Brazer and Anderson (1975), alternative specifications that used different independent variables yielded very similar indexes as evidenced by the correlation coefficients. Once the supply-demand framework is accepted, marginally different decisions about independent variables do not dramatically affect the price indexes.

Third, the question of the sensitivity of the indexes over time was analyzed. When indexes were estimated for a point in time three years later than the original indexes, few changes surfaced. These results suggest that price indexes may not have to be reestimated more often than once every five years.

The price indexes estimated in this article were not robust in every instance. Specifically, the estimated magnitude of the variation due to price differences was affected by the treatment of the two teacher "quality" variables, average years of teaching experience, AYTE, and education levels of teachers measured by the percent holding Masters degrees or higher, PTECM. Indexes that considered AYTE and PTECM not as quality, but as part of the salary schedule that is beyond the districts' control, had standard deviations in the .07 to .12 range. Indexes that assumed that AYTE and PTECM were controllable and representative of quality had smaller variation with standard deviations from .03 to .07. These latter indexes were estimated using both average teachers' salaries (ATS) and fixed points on the salary scale (SBA and SMA) as dependent variables. Although the total variation differed depending upon the assumptions regarding AYTE and PTECM, the indexes were still highly correlated among themselves. However, compared to the other alterations in the price indexes examined in this article, changes in the assumptions surrounding AYTE and PTECM had the greatest effect on the relative agreement among the indexes. Note also that while the Pearson correlation was utilized in the article, the Spearman rank correlations are very nearly the same. For the 55 correlations shown in Table 2, the average Spearman rank correlation is .826 compared to the average Pearson correlation of .862 in Table 2.

Previous articles on price indexes estimated from district level data gave the impression that considerably different assumptions yielded widely varying indexes. This article has demonstrated that within, perhaps, a narrower band of assumptions, the resulting indexes are comparatively stable. Clearly, much more research is needed before we know for sure which assumptions matter and which ones do not, but at least every single alternative assumption does not appear to produce a unique price index.

Appendix 1

Data Definitions and Data Sources

Many of the variables were obtained from Michigan Department of Education Financial, Student, and Staff Tapes and from the 1970 Census Fourth Count (Population) School District Data Tapes. These two sources will be represented by MICH TAPES and 1970 CENSUS SCHOOL DISTRICT, respectively, below. Variable symbols followed by XX are included in the analysis for various school years where the year is the second year of the school year (i.e. 73 = 72-73). All data are available on a district basis unless otherwise indicated.

Symbol	Definition	Source
AYTEXX	Average years of teaching experience of all teachers.	MICH TAPES
CE	Dummy variable = 1 if the district is located in the central city of a standard metropolitan statistical area as defined by the 1970 Census of Population and City of Pontiac, 0 otherwise.	1970 Census School District
CENT	Dummy variable = 1 if district is located in northern part of lower peninsula, 0 otherwise.	Michigan Statistical Abstract (1978)
CHIN70YY	For districts that are coterminous with incorporated places of 1,000 or more, the proportion change in per capita money income between 1970 and year YY for the incorporated place that corresponds to the district. For all other districts, the proportion change in per capita income in county (less coterminous districts) between 1970 and year YY.	Michigan Statistical Abstract (1977, 1978), from Bureau of the Census, special release.
CONTRACT	Dummy variable = 1 if teachers' contract has both agency shop and binding arbitration, 0 otherwise, 1973-74.	Michigan Education Association, Summary of Salary Schedules and Selected Contract Provisions, 1973-74.
DENS	Population per square mile in the county in which school district is located, 1970.	Michigan Statistical Abstract (1978) from U.S. Census of Population
DISSMC	Number of districts per square mile in the county in which district is located.	MICH TAPES, Michigan Statistical Abstract (1978), from U. S. Census of Population.
LIOPUPXX	Logarithm (base ten) of pupils.	MICH TAPES
METRO	Dummy variable = 1 if district is located in the Detroit SMSA (Wayne, Macomb, Oakland Counties), 0 otherwise.	Michigan Statistical Abstract (1978), U.S. Bureau of the Census.

Symbol	Definition	Source
MILLVXX	Extra voted millage, voted by school district, in addition to millage allocated by county.	MICH TAPES
MLEMP	Median yearly earnings of all male civilian employees aged 16 and over in the county in 1969.	U.S. Department of Commerce, General Social and Economic Statistics, Michigan (1972).
MOB	Percent of population over age 5 who were living in same house in 1970 as 1965.	1970 Census School District
MFY	Median family income in 1969.	1970 Census School District
PCOL	Percent of adults in population with one or more years of college, 1970.	1970 Census School District
PFOR	Proportion of population who were born abroad or had parents born abroad.	1970 Census School District
PMALESXX	Percent of teachers who are males.	MICH TAPES
PMI	Percent of the population black or Negro or Spanish surname in 1969.	1970 Census School District
PRICH	Percent of families with income greater than $15,000 in 1969.	1970 Census School District
PRPUPXX	Number of professionals other than teachers per one thousand students.	MICH TAPES
PTECM	Percent of teachers holding Masters degrees or higher.	MICH TAPES
PUPPOPXX	Ratio of pupils in district in year XX to population in district in 1970.	MICH TAPES, 1970 Census School District
PUPSQXX	Number of pupils squared.	MICH TAPES
PUPXX	Number of pupils.	MICH TAPES
RES	Percent of equalized value of property that is residential in 1970.	1970 State of Michigan Tax Commission tapes and estimates from school district & minor civil division (MCD) maps of overlap between school districts and MCD's.
REVPLXX	Revenue from local sources as a proportion of total general revenues.	MICH TAPES
RUR	Dummy variable = 1 if the district is located in area defined as rural by the 1970 Census of Population, 0 otherwise.	1970 Census School District

Symbol	Definition	Source
SBA	Starting salary for teacher with a BA and no experience in 1973-74.	Michigan Education Association, Summary of Salary Schedules and Other Selected Contract Provisions 1973-74.
SEVPXX	State equalized value of property in thousands of dollars per pupil.	MICH TAPES
SKCF	Basic skills composite achievement test scores for fourth graders, 1972-73.	MICH TAPES
SMA	Starting salary for teacher with an MA and no experience, 1973-74.	Michigan Education Association, Summary of Salary Schedules and Other Selected Contract Provisions 1973-74.
SPEDXX	Proportion of pupils in district who are special education.	MICH TAPES
STDIPPXX	State aid (membership and categorical) per pupil.	MICH TAPES
STRIKE	Number of days teachers on strike in district, 1970 to 1972.	Michigan Education Association.
SUB	Dummy variable = 1 if the district is located in a suburban area, 0 otherwise.	1970 Census School District
TPUPXX	Teachers per one thousand pupils.	MICH TAPES
TTFDPPXX	Federal aid per pupil.	MICH TAPES
UP	Dummy variable = 1 if district is located in upper peninsula, 0 otherwise.	Michigan Statistical Abstract (1978).

Note: The control variable for the dummy variables CE, RUR, and SUB is the independent (non-SMSA) cities, 1970 population between 4,000 and 50,000. The control variable for the dummy variables METRO, UP, and CENT is the area in the southern part of the lower peninsula not in the Detroit SMSA.

APPENDIX 2

Two-Stage Least Squares Results for Demand-Supply Equations With SMA as Dependent Variable and With 1975-76 Updated Variables

Table 2.1a

TSLS ESTIMATES OF DEMAND FOR STARTING M.A. SALARIES (SMA) IN 469 MICHIGAN SCHOOL DISTRICTS FOR 1972-73 USING B-A SPECIFICATION

Variable	Regression Coefficient	't' Statistic
INTERCEPT	11776.	17.64
TPUP73*	-107.1	-6.62
MILLV73*	112.5	5.60
PCOL	-3.691	-.66
PPUPOP73	1083.	1.65
PFOR	1154.	2.91
MOB	-1.698	-.40
PRICH	2.958	.65
SEVP73	54.28	4.02
REVPL73	-2157.	-2.93
RES	-5.737	-2.88

SST(SMA) = 112,523,293

SSE(Equation) = 146,795,254

*Endogenous Variable

Table 2.1b

TSLS ESTIMATES OF SUPPLY FOR STARTING M.A. SALARIES (SMA) IN 469 MICHIGAN SCHOOL DISTRICTS FOR 1972-73 USING B-A SPECIFICATION

Variable	Regression Coefficient	't' Statistic
INTERCEPT	7152.	8.58
TPUP73*	.5522	.04
LIOPUP73	292.1	2.52
SKCF	7.603	.89
PMALES73	2.197	.72
CE	136.2	1.06
RUR	-203.9	-2.20
SUB	-43.41	-.53
PNW	.5148	.15
MFY	.0291	1.75
DENS	.1546	7.47
MLEMP	.0216	.85
PCOL	-5.240	-1.50
STRIKE	-.6848	-.09
CONTRACT	134.7	3.99

SST(SMA) = 112,523,293

SSE(Equation) = 51,168,542

*Endogenous Variable

Table 2.1c

TSLS ESTIMATES OF DEMAND EQUATION FOR STARTING M.A. SALARIES (SMA) IN 470 MICHIGAN SCHOOL DISTRICTS IN 1972-73 USING REFORMULATED SPECIFICATION

Variable	Regression Coefficient	't' Statistic
INTERCEPT	8359.	16.06
TPUP73*	-18.17	-1.89
PCOL	-.8337	-.27
PPUPOP73	-17.58	-.05
PFOR	670.7	2.54
PMALES	-3.697	-1.09
DISSMC	13788.	7.33
SEVP73	4.382	.69
RES	-.0455	-.04
MFY	.0622	4.28
CHIN7073	2490.	2.78
STDIPP73	-.0197	-.05
TTFDPP73	1.409	2.55

SST(SMA) = 112,524,469

SSE(Equation) = 60,377,873

*Endogenous Variable

Table 2.1d

TSLS ESTIMATES OF SUPPLY EQUATION FOR STARTING M.A. SALARIES (SMA) IN 470 MICHIGAN SCHOOL DISTRICTS IN 1972-73 USING REFORMULATED SPECIFICATION

Variable Variable	Regression Coefficient	't' Statistic
INTERCEPT	7401.	13.52
TPUP73*	23.12	1.88
PUP73	.0298	5.89
PUPSQ73	96X10^{-6}	-5.40
SPED73	3575.	1.68
PRPUP73	-5.733	-1.43
PMALES73	-1.557	-.43
DISSMC	16456.	6.51
METRO	-84.53	-.84
UP	114.8	1.28
CENT	-50.26	-.66
PNW	-1.225	-.35
MLEMP	.0394	1.57
CONTRACT	173.7	4.55

SST(SMA) = 112,524,469

SSE(Equation) = 66,569,974

*Endogenous Variable

Table 2.2a

TSLS ESTIMATES OF DEMAND EQUATIONS FOR AVERAGE TEACHERS SALARIES (ATS76) IN 471 MICHIGAN SCHOOL DISTRICTS IN 1975-76 USING B-A SPECIFICATION

Variable	Regression Coefficient	't' Statistic
INTERCEPT	15283.	7.27
TPUP76*	-268.3	-7.42
MILLV76*	601.9	7.15
PCOL	-44.31	-2.65
PPUPOP76	-891.2	-.49
MOB	-6.869	-.51
PRICH	-2.357	-.15
SEVP76	94.01	6.80
REVPL76	-2241.	-2.64
RES	-8.650	-1.43

SST(ATS) = 1,433,754,847

SSE(Equation) = 1,473,363,751

*Endogenous Variable

135

Table 2.2b

TSLS ESTIMATES OF SUPPLY EQUATIONS FOR AVERAGE TEACHERS SALARIES (ATS76)
IN 471 MICHIGAN SCHOOL DISTRICTS IN 1975-76 USING B-A SPECIFICATION

Variable	Regression Coefficient	't' Statistic
INTERCEPT	3539	1.87
TPUP76*	-1.821	-.07
AYTE76	226.4	10.18
PTCEM76	27.71	6.06
LIOPUP76	773.4	2.69
SKCF	-7.274	-.37
PMALES76	25.62	3.74
CE	565.8	2.03
RUR	62.37	.32
SUB	301.8	1.77
PNW	7.887	1.00
MFY	.1166	3.19
DENS	.4130	8.71
MLEMP	.2520	4.53
PCOL	-1.393	-.20
STRIKE	17.63	1.11
CONTRACT	183.4	2.48

SST(ATS) = 1,433,754,847

SSE(Equation) = 239,890,291

*Endogenous Variable

Table 2.2c

TSLS ESTIMATES OF DEMAND EQUATIONS FOR AVERAGE TEACHERS SALARY (ATS76) IN 472 MICHIGAN SCHOOL DISTRICTS IN 1975-76 USING REFORMULATED SPECIFICATION

Variable	Regression Coefficient	't' Statistic
INTERCEPT	17448.	11.60
TPUP76*	-233.7	-8.01
PCOL	7.448	.73
PPUPOP76	-6883.	-6.50
PFOR	2197.	2.49
PMALES76	27.29	2.31
DISSMC	39352.	6.11
SEVP76	28.24	3.98
RES	4.020	.98
MFY	.2927	5.88
CHIN7076	2684.	2.11
STDIPP76	.2407	.53
TTFDPP76	4.727	3.84

SST(ATS) = 1,437,042,100

SSE(Equation) = 707,843,869

*Endogenous Variable

Table 2.2d

TSLS ESTIMATES OF SUPPLY EQUATIONS FOR AVERAGE TEACHERS SALARY (ATS76) IN 472 MICHIGAN SCHOOL DISTRICTS IN 1975-76 USING REFORMULATED SPECIFICATION

Variable	Regression Coefficient	't' Statistic
INTERCEPT	5915.	5.99
TPUP76*	13.51	.67
AYTE76	240.3	10.43
PTCEM76	41.50	9.51
PUP76	.0542	4.30
PUPSQ76	-.0002	-4.13
SPED76	383.1	.11
PRPUP76	3.315	.49
PMALES76	10.64	1.30
DISSMC	27022.	5.14
METRO	495.9	2.37
UP	22.48	.13
CENT	-236.9	-1.55
PNW	1.565	.21
MLEMP	.2503	4.78
CONTRACT	242.7	3.02

SST(ATS) = 1,437,042,100

SSE (Equation) = 284,681,340

*Endogenous Variable

APPENDIX 3

Value of Price Indexes
For Each Michigan School District

DISTRICT NAME	NUMBER	UINDEX1	UINDEX2	UINDEX3	INDEXB	INDEX1	INDEX2	INDEX3	BRSBA	LBSBA	BRSMA	LBSMA
ALCONA COMMUNITY SCHOOLS	1010	0.930	0.904	0.897	.	0.881	0.918	0.864	0.976	0.954	0.969	0.961
BURT TOWNSHIP SCHOOL	2020	1.018	0.931	1.099	.	0.952	0.918	1.053	0.955	0.967	0.945	0.979
MATHIAS TOWNSHIP SCHOOL	2060	.	0.931	0.891	.	.	0.918	0.946	.	0.967	.	0.979
MUNISING PUBLIC SCHOOLS	2070	0.966	0.936	0.948	0.921	0.981	0.928	0.958	0.994	0.972	0.996	0.985
ROCK RIVER TOWNSHIP SCHOOL	2080	0.885	0.932	0.894	.	0.907	0.919	0.922	0.970	0.968	0.962	0.980
PLAINWELL COMMUNITY SCHOOLS	3010	1.009	0.969	1.000	.	1.004	0.978	0.995	0.999	0.992	1.001	0.991
OTSEGO PUBLIC SCHOOLS	3020	0.991	0.970	0.980	0.902	0.973	0.977	0.957	1.002	0.992	1.004	0.991
ALLEGAN PUBLIC SCHOOLS	3030	0.985	0.971	0.961	0.938	1.007	0.980	0.997	1.002	0.993	1.005	0.993
WAYLAND UNION SCHOOLS	3040	0.918	0.969	0.905	.	0.922	0.967	0.898	0.990	0.985	0.985	0.984
FENNVILLE PUBLIC SCHOOLS	3050	0.926	0.966	0.920	.	0.928	0.961	0.912	0.986	0.983	0.980	0.980
MARTIN PUBLIC SCHOOLS	3060	0.910	0.963	0.923	.	0.928	0.963	0.943	0.977	0.984	0.969	0.982
HOPKINS PUBLIC SCHOOL	3070	0.890	0.963	0.884	.	0.903	0.964	0.901	0.984	0.984	0.978	0.982
SAUGATUCK PUBLIC SCHOOLS	3080	0.907	0.962	0.925	.	0.922	0.974	0.959	0.970	0.990	0.961	0.989
HAMILTON COMMUNITY SCHOOLS	3100	0.959	0.965	0.955	.	0.977	0.961	0.969	0.988	0.982	0.983	0.980
ALPENA CITY SCHOOL DISTRICT	4010	1.065	0.965	1.044	1.014	1.090	1.004	1.074	1.017	0.987	1.023	0.986
ALBA PUBLIC SCHOOL	5010	.	0.925	0.842	.	.	0.955	0.893	.	0.982	.	0.993
BELLAIRE PUBLIC SCHOOL	5040	0.936	0.927	0.956	.	0.916	0.939	0.944	0.967	0.972	0.958	0.983
ELK RAPIDS SCHOOLS	5060	0.918	0.929	0.916	.	0.908	0.945	0.922	0.972	0.975	0.963	0.986
MANCELONA PUBLIC SCHOOL	5070	0.932	0.929	0.928	0.956	0.962	0.947	0.986	0.976	0.976	0.969	0.988
ARENAC EASTERN SCHOOL DIST	6010	0.808	0.948	0.800	.	0.867	0.951	0.894	0.971	0.979	0.963	0.979
AU GRES SIMS SCHOOL DISTRICT	6020	0.911	0.948	0.922	0.835	0.870	0.975	0.915	0.973	0.992	0.964	0.994
STANDISH STERL COMM SCH DIST	6050	0.979	0.955	0.975	.	0.996	0.965	0.996	0.989	0.986	0.984	0.987
BARAGA TOWNSHIP SCHOOL DIST	7020	0.879	0.940	0.873	.	0.920	0.959	0.947	0.976	0.984	0.969	0.994
L ANSE TWP SCHOOL DISTRICT	7040	1.010	0.940	1.006	.	1.016	0.931	1.012	0.991	0.969	0.992	0.976
DELTON KELLOGG SCHOOL DIST	8010	0.942	0.965	0.929	0.899	0.946	0.970	0.927	0.991	0.980	0.985	0.973
HASTINGS PUBLIC SCHOOL DIST	8030	1.027	0.971	0.998	.	1.055	0.981	1.031	1.006	0.986	1.008	0.979
THORNAPPLE KELLOGG SCH DIST	8050	0.961	0.964	0.955	.	0.981	0.969	0.968	0.988	0.980	0.981	0.972
BAY CITY SCHOOL DISTRICT	9010	1.140	1.036	1.110	1.140	1.147	1.062	1.127	1.044	1.026	1.053	1.026
BANGOR TOWNSHIP SCHOOLS	9030	1.025	0.989	0.994	.	1.003	1.006	0.971	1.009	0.998	1.012	0.991
ESSEXVILLE HAMPTON SCH DIST	9050	1.087	0.979	1.085	.	1.068	0.986	1.070	1.002	0.989	1.003	0.979
PINCONNING AREA SCHOOLS	9090	0.969	0.985	0.938	.	0.979	0.992	0.955	1.000	0.991	0.996	0.982
BENZIE CO CENTRAL SCHOOLS	10015	0.929	0.910	0.900	.	0.941	0.927	0.927	0.980	0.966	0.974	0.978
FRANKFORT AREA SCHOOLS	10025	0.882	0.906	0.865	.	0.896	0.923	0.894	0.972	0.963	0.964	0.976
BENTON HARBOR CITY SCH DIST	11010	1.063	1.038	1.095	1.023	1.071	1.021	1.058	1.020	1.040	1.028	1.038
ST JOSEPH CITY SCHOOL DIST	11020	1.091	1.010	1.140	1.043	1.103	0.999	1.106	1.007	1.009	1.013	1.010
LAKESHORE SCHOOL DISTRICT	11030	1.034	1.010	1.046	.	1.021	1.005	1.015	1.006	1.012	1.008	1.013
RIVER VALLEY SCHOOL DISTRICT	11033	0.971	1.002	0.996	.	1.043	0.997	1.067	0.992	1.008	0.987	1.009
GALIEN TOWNSHIP SCHOOL	11160	0.907	0.997	0.943	.	0.888	0.982	0.911	0.981	1.000	0.974	0.999
NEW BUFFALO AREA SCHOOL DIST	11200	0.984	0.999	0.991	.	1.020	0.985	1.021	0.999	1.002	1.001	1.001
BRANDYWINE PUBLIC SCH DIST	11210	1.004	1.004	1.009	0.894	1.002	0.999	1.007	1.004	1.011	1.006	1.011
BERRIEN SPRINGS PUB SCH DIST	11240	0.996	1.004	1.032	.	1.011	1.021	1.049	0.982	1.025	0.973	1.026
EAU CLAIRE PUBLIC SCH DIST	11250	0.929	1.000	0.954	.	0.919	0.981	0.924	0.985	1.006	0.978	1.003
NILES COMMUNITY SCHOOL DIST	11300	1.039	1.019	1.070	1.026	1.068	1.016	1.072	1.016	1.021	1.023	1.023
BUCHANAN PUBLIC SCHOOL DIST	11310	1.046	1.004	1.061	.	1.033	0.997	1.039	1.004	1.011	1.006	1.011
WATERVLIET SCHOOL DISTRICT	11320	0.920	1.000	0.936	.	0.935	0.988	0.936	0.988	1.003	0.982	1.003
COLOMA COMMUNITY SCHOOLS	11330	0.979	1.005	0.999	.	0.961	0.999	0.956	0.995	1.010	0.991	1.010
BRIDGMAN PUBLIC SCHOOL	11340	0.952	0.996	0.999	.	0.964	0.982	0.998	0.982	1.000	0.976	0.999
COLDWATER COMMUNITY SCHOOLS	12010	0.997	0.959	0.967	0.931	1.007	0.973	0.981	1.007	0.989	1.011	0.990
BRONSON COMMUNITY SCH DIST	12020	0.958	0.948	0.956	.	0.946	0.963	0.954	0.985	0.984	0.979	0.984
QUINCY COMMUNITY SCHOOL DIST	12040	0.934	0.947	0.925	.	0.935	0.959	0.933	0.984	0.982	0.978	0.982
ALBION CITY SCHOOLS	13010	0.999	0.998	1.013	.	1.016	0.987	1.001	1.008	1.005	1.013	0.996
BATTLE CREEK PUBLIC SCHOOLS	13020	1.106	1.022	1.086	1.027	1.097	1.026	1.065	1.035	1.024	1.042	1.019
SPRINGFIELD CITY SCHOOL DIST	13030	1.077	0.988	1.099	.	1.035	1.008	1.081	0.994	1.008	0.994	1.002
ATHENS AREA SCHOOLS	13050	0.899	0.987	0.898	.	0.900	0.992	0.913	0.984	0.997	0.977	0.991
HARPER CREEK COMM SCHOOLS	13070	1.010	0.995	0.999	0.994	1.028	1.000	1.022	1.006	1.002	1.009	0.996

DISTRICT NAME	NUMBER	UINDEX1	UINDEX2	UINDEX3	INDEX0	INDEX1	INDEX2	INDEX3	BRSDA	LBSDA	BRSMA	LBSMA
HOMER COMMUNITY SCHOOLS	13080	0.970	0.988	0.977	.	1.009	0.989	1.025	0.988	0.995	0.982	0.988
LAKEVIEW CONS SCHOOL DIST	13090	1.083	1.001	1.086	1.023	1.115	1.009	1.107	1.008	1.005	1.010	1.001
MARSHALL PUBLIC SCHOOLS	13110	1.042	0.994	1.040	0.951	1.033	1.008	1.010	1.005	1.006	1.008	1.001
PENNFIELD SCHOOL DISTRICT	13120	0.989	0.991	0.982	.	0.972	0.991	0.954	1.000	0.997	1.002	0.991
TEKONSHA COMMUNITY SCHOOL	13130	0.918	0.985	0.939	.	0.887	0.986	0.903	0.980	0.994	0.973	0.987
UNION CITY COMM SCHOOL DIST	13135	0.883	0.989	0.874	.	0.962	0.991	0.970	0.989	0.996	0.983	0.989
CASSOPOLIS PUBLIC SCHOOLS	14010	0.912	0.969	0.896	.	0.924	0.949	0.887	0.986	0.984	0.980	0.974
DOWAGIAC UNION SCHOOLS	14020	0.992	0.975	0.956	0.966	1.016	0.973	0.981	1.006	0.990	1.000	0.984
EDWARDSBURG PUBLIC SCHOOLS	14030	0.966	0.967	0.961	.	0.968	0.968	0.956	0.990	0.983	0.985	0.977
MARCELLUS COMMUNITY SCHOOLS	14050	0.945	0.963	0.934	.	0.943	0.965	0.950	0.983	0.982	0.977	0.975
BEAVER ISLAND COMM SCHOOLS	15010	.	0.922	0.954	.	.	0.929	1.096	.	0.963	.	0.979
TWIN VALLEY PUBLIC SCH DIST	15025	0.981	0.933	0.941	.	1.015	0.952	0.997	0.999	0.975	1.001	0.985
BOYNE FALLS PUBLIC SCH DIST	15030	.	0.923	0.831	.	.	0.930	0.851	.	0.964	.	0.971
CENTRAL LAKE PUBLIC SCHOOL	5035	0.898	0.927	0.905	.	0.889	0.932	0.904	0.968	0.968	0.958	0.978
CHARLEVOIX PUBLIC SCH DIST	15050	0.945	0.928	0.909	.	0.962	0.938	0.943	0.990	0.968	0.991	0.974
ELLSWORTH COMMUNITY SCHOOL	5065	.	0.925	0.866	.	.	0.931	0.854	.	0.968	.	0.977
CHEBOYGAN AREA SCHOOLS	16015	1.001	0.927	0.956	1.005	1.004	0.953	0.976	1.000	0.972	1.002	0.980
INLAND LAKES SCHOOL DISTRICT	16050	0.952	0.919	0.935	.	0.930	0.939	0.939	0.973	0.965	0.965	0.971
MACKINAW CITY PUBLIC SCHOOLS	16070	0.863	0.916	0.860	.	0.861	0.927	0.884	0.966	0.959	0.957	0.963
WOLVERINE COMMUNITY SCH DIST	16100	.	0.917	0.772	.	.	0.927	0.816	.	0.959	.	0.963
SAULT STE MARIE AREA SCHOOLS	17010	0.947	0.946	0.927	0.904	0.982	0.943	0.940	1.006	0.981	1.012	0.998
DETOUR TWP SCHOOL	17050	0.898	0.927	0.911	.	0.897	0.915	0.906	0.964	0.966	0.955	0.980
PICKFORD PUBLIC SCHOOLS	17090	0.936	0.929	0.938	.	0.928	0.915	0.935	0.972	0.966	0.965	0.980
RUDYARD AREA SCHOOLS	17110	0.971	0.935	0.953	.	0.952	0.923	0.911	0.994	0.975	0.995	0.988
BRIMLEY PUBLIC SCHOOLS	17140	0.856	0.928	0.855	0.769	0.856	0.915	0.864	0.965	0.966	0.956	0.980
WHITEFISH SCHOOL	17160	.	0.926	0.916	.	.	0.913	0.918	.	0.965	.	0.979
CLARE PUBLIC SCHOOLS	18010	1.054	0.946	1.055	.	1.035	0.944	1.028	0.995	0.973	0.996	0.972
FARWELL AREA SCHOOLS	18020	0.899	0.946	0.892	.	0.903	0.958	0.907	0.981	0.981	0.974	0.982
HARRISON COMMUNITY SCHOOLS	18060	0.888	0.947	0.868	.	0.915	0.961	0.915	0.983	0.982	0.977	0.983
DE WITT PUBLIC SCHOOLS	19010	0.937	0.985	0.916	.	0.931	0.983	0.912	0.997	0.987	0.997	0.976
FOWLER PUBLIC SCHOOLS	19070	0.862	0.980	0.862	.	0.884	0.980	0.900	0.983	0.985	0.976	0.974
BATH COMMUNITY SCHOOLS	19100	0.944	0.982	0.934	.	0.943	0.998	0.950	0.994	0.996	0.994	0.986
OVID ELSIE AREA SCHOOLS	19120	0.979	0.987	0.975	.	0.988	1.001	0.995	0.994	0.997	0.989	0.987
PEWAMO-WESTPHALIA COMM S D	19125	0.898	0.980	0.895	.	0.900	0.981	0.909	0.982	0.986	0.974	0.975
ST JOHNS PUBLIC SCHOOLS	19140	1.009	0.994	0.981	0.943	1.029	1.002	1.005	1.010	0.997	1.013	0.988
CRAWFORD AUSABLE SCHOOLS	20015	0.896	0.912	0.855	.	0.912	0.936	0.893	0.984	0.963	0.978	0.970
ESCANABA AREA PUBLIC SCHOOLS	21010	1.037	0.973	1.035	1.020	1.058	0.974	1.033	1.011	0.990	1.017	0.998
GLADSTONE PUBLIC SCHOOL DIST	21025	0.991	0.962	0.964	.	1.008	0.959	0.978	1.000	0.982	1.002	0.989
BALDWIN TOWNSHIP SCHOOL	21040	.	0.953	0.912	.	.	0.941	0.909	.	0.973	.	0.978
RAPID RIVER PUBLIC SCHOOLS	21060	0.876	0.954	0.878	0.854	0.859	0.943	0.864	0.978	0.974	0.970	0.979
BIG BAY DE NOC SCHOOL DIST	21065	0.849	0.955	0.842	.	0.871	0.951	0.871	0.976	0.979	0.968	0.984
BARK RIVER HARRIS SCH DIST	21090	0.964	0.955	0.972	0.947	0.956	0.950	0.970	0.979	0.978	0.972	0.984
ROCK PUBLIC SCHOOL DISTRICT	21130	0.874	0.953	0.889	.	0.862	0.942	0.893	0.964	0.974	0.954	0.978
IRON MOUNTAIN CITY SCH DIST	22010	1.021	0.953	1.026	1.015	1.000	0.954	0.998	0.997	0.982	0.999	0.990
NORWAY VULCAN AREA SCHOOLS	22025	1.028	0.950	1.037	.	0.998	0.947	1.006	0.991	0.978	0.992	0.986
BREITUNG TOWNSHIP SCH DIST	22030	1.022	0.957	1.008	.	0.987	0.950	0.950	1.000	0.979	1.002	0.987
NORTH DICKINSON CO SCH DIST	22045	0.990	0.948	1.026	.	0.982	0.936	1.023	0.974	0.972	0.966	0.979
BELLEVUE COMMUNITY SCHOOLS	23010	0.937	0.992	0.940	0.909	0.929	0.995	0.932	0.987	0.992	0.980	0.979
CHARLOTTE PUBLIC SCHOOLS	23030	1.037	1.003	1.024	.	1.042	1.010	1.023	1.009	0.999	1.012	0.988
EATON RAPIDS PUBLIC SCHOOLS	23050	0.976	1.001	0.953	0.940	1.016	1.009	0.997	1.007	0.999	1.009	0.988
GRAND LEDGE PUBLIC SCHOOLS	23060	0.995	1.011	0.968	0.898	1.014	1.015	0.980	1.011	1.001	1.013	0.991
MAPLE VALLEY SCHOOL DISTRICT	23065	0.910	0.995	0.894	.	0.918	0.999	0.902	0.990	0.994	0.983	0.981
OLIVET COMMUNITY SCHOOLS	23080	0.967	0.992	0.973	.	0.973	0.992	0.980	0.984	0.991	0.977	0.977
POTTERVILLE PUBLIC SCHOOLS	23090	0.884	0.990	0.888	.	0.886	0.995	0.898	0.980	0.992	0.971	0.979
HARBOR SPRINGS SCHOOL DIST	24020	0.967	0.920	0.979	0.893	0.958	0.940	0.979	0.973	0.966	0.964	0.972

DISTRICT NAME	NUMBER	UINDEX1	UINDEX2	UINDEX3	INDEXB	INDEX1	INDEX2	INDEX3	BRSDA	LBSDA	BRSMA	LBSMA
LITTLEFIELD PUBLIC SCH DIST	24030	0.911	0.926	0.922	.	0.876	0.935	0.895	0.965	0.964	0.955	0.969
PELLSTON PUBLIC SCHOOL DIST	24040	0.876	0.928	0.854	.	0.893	0.944	0.890	0.975	0.969	0.968	0.975
PETOSKEY SCHOOL DISTRICT	24070	0.979	0.937	0.935	0.943	1.005	0.958	0.903	0.997	0.976	0.999	0.983
FLINT CITY SCHOOL DISTRICT	25010	1.191	1.174	1.265	1.143	1.198	1.196	1.269	1.060	1.122	1.072	1.135
GRAND BLANC COMM SCHOOLS	25030	1.045	1.060	1.041	0.944	1.044	1.055	1.027	1.019	1.037	1.024	1.036
MT MORRIS CONS SCHOOLS	25040	0.994	1.043	0.985	.	1.011	1.040	1.008	1.016	1.030	1.022	1.027
GOODRICH AREA SCHOOL DIST	25050	0.963	1.034	0.988	.	0.960	1.019	0.973	0.991	1.019	0.987	1.014
BENDLE PUBLIC SCHOOL DIST	25060	1.039	1.037	1.045	.	1.005	1.039	1.019	1.012	1.030	1.017	1.027
GENESEE SCHOOL DISTRICT	25070	0.909	1.032	0.910	.	0.894	1.009	0.890	0.997	1.016	0.999	1.010
CARMAN SCHOOL DISTRICT	25080	1.100	1.062	1.113	0.987	1.075	1.067	1.077	1.025	1.043	1.031	1.043
FENTON AREA PUBLIC SCHOOLS	25100	1.081	1.042	1.093	.	1.078	1.038	1.083	1.013	1.029	1.018	1.026
KEARSLEY COMMUNITY SCHOOLS	25110	1.071	1.050	1.000	0.984	1.031	1.046	1.014	1.021	1.032	1.027	1.031
FLUSHING COMMUNITY SCHOOLS	25120	1.012	1.052	1.010	0.893	1.012	1.047	0.993	1.019	1.033	1.025	1.031
ATHERTON COMM SCHOOL DIST	25130	1.056	1.037	1.073	.	1.033	1.028	1.041	1.010	1.024	1.015	1.020
DAVISON COMMUNITY SCHOOLS	25140	1.023	1.052	1.016	0.943	1.009	1.046	0.992	1.020	1.033	1.026	1.031
CLIO AREA SCHOOL DISTRICT	25150	0.998	1.051	1.005	0.936	1.016	1.046	1.009	1.010	1.033	1.009	1.031
SWARTZ CREEK COMM SCH DIST	25180	1.043	1.051	1.045	0.954	1.025	1.043	1.008	1.020	1.030	1.026	1.028
LAKE FENTON SCHOOL	25200	1.000	1.036	1.013	0.874	0.979	1.023	0.983	1.006	1.021	1.009	1.016
WESTWOOD HEIGHTS SCH DIST	25210	1.063	1.037	1.078	.	1.012	1.031	1.019	1.010	1.027	1.015	1.022
BENTLEY COMM SCHOOL DISTRICT	25230	1.033	1.037	1.046	.	1.054	1.029	1.068	1.011	1.024	1.015	1.020
BEECHER SCHOOL DISTRICT	25240	1.064	1.054	1.062	1.013	1.044	1.051	1.019	1.022	1.040	1.029	1.032
LINDEN COMMUNITY SCHOOL DIST	25250	0.956	1.039	0.972	.	0.960	1.022	0.956	0.999	1.020	0.995	1.016
MONTROSE TOWNSHIP SCHOOLS	25260	0.982	1.037	1.010	.	0.987	1.026	0.995	1.001	1.024	0.998	1.019
LAKEVILLE COMM SCH DIST	25280	0.996	1.041	1.011	.	0.964	1.028	0.954	1.004	1.024	1.001	1.020
BEAVERTON RURAL SCHOOLS	26010	0.944	0.959	0.932	.	0.942	0.967	0.933	0.988	0.978	0.982	0.970
GLADWIN COMMUNITY SCHOOLS	26040	0.944	0.961	0.930	.	0.973	0.971	0.965	0.989	0.980	0.983	0.972
BESSEMER CITY SCHOOL DIST	27010	0.971	0.934	0.978	.	0.945	0.921	0.944	0.984	0.969	0.984	0.981
IRONWOOD AREA SCHOOLS	27020	1.054	0.941	1.048	.	1.107	0.933	1.094	0.999	0.975	1.002	0.988
MARENISCO SCHOOL DISTRICT	27060	.	0.932	0.884	.	.	0.919	0.868	.	0.967	.	0.979
WAKEFIELD TWP SCH DIST	27070	1.014	0.934	1.021	.	1.050	0.932	1.070	0.988	0.974	0.989	0.988
WATERSMEET TWP SCH DIST	27080	.	0.932	0.864	.	.	0.919	1.023	.	0.968	.	0.980
TRAVERSE CITY PUB SCH DIST	28010	1.037	0.971	1.019	0.977	1.059	1.003	1.037	1.015	0.992	1.022	0.996
BUCKLEY COMMUNITY SCH DIST	28035	.	0.936	0.846	.	.	0.957	0.897	.	0.969	.	0.968
KINGSLEY AREA SCHOOL DIST	28090	0.865	0.936	0.845	0.818	0.850	0.966	0.861	0.975	0.975	0.967	0.974
ALMA PUBLIC SCHOOLS	29010	1.020	0.968	1.007	.	1.025	0.974	1.002	1.001	0.991	1.003	0.993
ASHLEY COMMUNITY SCHOOLS	29020	0.849	0.956	0.856	.	0.811	0.956	0.823	0.973	0.982	0.965	0.982
BRECKENRIDGE COMM SCHOOLS	29040	0.899	0.960	0.889	.	0.916	0.966	0.912	0.986	0.988	0.981	0.988
FULTON SCHOOLS	29050	0.949	0.958	0.954	.	0.950	0.960	0.951	0.984	0.984	0.978	0.984
ITHACA PUBLIC SCHOOLS	29060	0.986	0.961	0.969	.	1.006	0.969	0.997	0.997	0.989	0.999	0.990
SAINT LOUIS PUBLIC SCHOOLS	29100	0.992	0.961	0.978	.	1.015	0.973	1.015	0.994	0.991	0.995	0.992
CAMDEN FRONTIER SCHOOL	30010	0.923	0.956	0.949	.	0.927	0.947	0.941	0.975	0.981	0.967	0.983
HILLSDALE COMMUNITY SCHOOLS	30020	1.024	0.965	1.022	.	1.063	0.978	1.074	0.997	0.998	0.998	1.003
JONESVILLE COMMUNITY SCHOOLS	30030	0.878	0.959	0.877	.	0.899	0.956	0.902	0.979	0.986	0.971	0.989
LITCHFIELD COMMUNITY SCHOOLS	30040	0.905	0.957	0.926	0.824	0.886	0.959	0.907	0.976	0.987	0.969	0.991
NORTH ADAMS PUBLIC SCHOOLS	30050	0.873	0.957	0.884	.	0.862	0.952	0.864	0.973	0.984	0.965	0.986
PITTSFORD RURAL AG SCHOOLS	30060	0.946	0.957	0.968	.	0.964	0.964	0.995	0.977	0.991	0.969	0.994
READING COMMUNITY SCHOOLS	30070	0.960	0.959	0.989	.	0.979	0.968	1.010	0.978	0.992	0.971	0.996
WALDRON AREA SCHOOLS	30080	0.848	0.956	0.859	.	0.877	0.957	0.908	0.973	0.986	0.964	0.990
HANCOCK CITY SCHOOL DISTRICT	31010	0.885	0.916	0.864	.	0.943	0.925	0.944	0.986	0.983	0.987	1.010
ADAMS TOWNSHIP SCHOOL DIST	31020	0.848	0.915	0.844	.	0.876	0.971	0.951	0.971	1.010	0.964	1.040
CALUMET PUBLIC SCHOOL DIST	31030	0.918	0.920	0.910	.	0.943	0.918	0.934	0.982	0.979	0.976	1.005
CHASSELL TOWNSHIP SCH DIST	31050	0.756	0.912	0.767	.	0.798	0.894	0.817	0.962	0.966	0.954	0.990
OSCEOLA TOWNSHIP SCH DIST	31100	.	0.912	0.828	.	.	0.895	0.815	.	0.966	.	0.991
PORTAGE TOWNSHIP SCH DIST	31110	0.880	0.916	0.861	0.767	0.915	0.908	0.890	0.980	0.973	0.979	0.999
LAKE LINDEN HUBBELL SCH DIST	31130	0.877	0.913	0.888	.	0.850	0.896	0.848	0.971	0.967	0.965	0.992

DISTRICT NAME	NUMBER	UINDEX1	UINDEX2	UINDEX3	INDEXD	INDEX1	INDEX2	INDEX3	BRSBA	LBSBA	BRSHA	LBSHA
BAD AXE PUBLIC SCHOOLS	32010	0.906	0.950	0.886	.	0.931	0.961	0.923	0.992	0.989	0.994	0.995
CASEVILLE PUBLIC SCHOOL	32030	.	0.944	0.899	.	.	0.935	0.903	.	0.975	.	0.979
ELKTON PIGEON BAYPORT S/DIST	32050	0.925	0.950	0.922	.	0.970	0.958	0.980	0.984	0.987	0.979	0.993
HARBOR BEACH COMM SCHOOL	32060	0.887	0.948	0.884	.	0.913	0.954	0.912	0.981	0.986	0.975	0.991
NORTH HURON SCHOOLS	32080	0.907	0.946	0.927	.	0.915	0.956	0.944	0.976	0.987	0.969	0.992
OWENDALE GAGETOWN AREA S D	32090	0.905	0.945	0.926	.	0.909	0.937	0.925	0.972	0.976	0.964	0.980
PORT AUSTIN PUBLIC SCHOOLS	32120	0.886	0.945	0.910	.	0.870	0.936	0.896	0.970	0.975	0.962	0.979
PORT HOPE COMMUNITY SCHOOLS	32130	.	0.944	0.892	.	.	0.935	0.965	.	0.975	.	0.979
UBLY COMMUNITY SCHOOLS	32170	0.869	0.949	0.857	.	0.879	0.945	0.871	0.981	0.981	0.975	0.985
EAST LANSING SCHOOL DISTRICT	33010	1.081	1.010	1.098	1.030	1.102	1.003	1.089	0.992	1.009	0.989	1.008
LANSING PUBLIC SCHOOL DIST	33020	1.155	1.106	1.188	1.136	1.167	1.145	1.215	1.050	1.083	1.060	1.098
DANSVILLE AG SCHOOL	33040	0.906	0.994	0.919	.	0.908	0.984	0.915	0.985	0.999	0.980	0.997
HASLETT PUBLIC SCHOOLS	33060	1.025	0.999	1.042	.	0.961	0.991	0.942	0.995	1.002	0.995	0.999
HOLT PUBLIC SCHOOLS	33070	1.025	1.008	1.018	.	1.008	1.007	0.990	1.010	1.010	1.013	1.010
LESLIE PUBLIC SCHOOLS	33100	0.922	0.997	0.928	.	0.941	0.989	0.943	0.992	1.001	0.988	0.998
MASON PUBLIC SCHOOLS	33130	1.029	1.004	1.025	.	1.010	1.005	0.993	1.008	1.010	1.012	1.009
OKEMOS PUBLIC SCHOOLS	33170	1.078	1.004	1.108	.	1.071	1.006	1.076	0.991	1.010	0.989	1.009
STOCKBRIDGE COMM SCHOOLS	33200	0.982	0.999	0.999	.	0.978	0.998	0.983	0.995	1.004	0.991	1.004
WAVERLY SCHOOLS	33215	1.100	1.008	1.114	0.990	1.116	1.009	1.119	1.009	1.012	1.012	1.011
WEBBERVILLE PUBLIC SCHOOLS	33220	0.876	0.994	0.911	.	0.897	0.981	0.921	0.982	0.997	0.975	0.994
WILLIAMSTON COMM SCHOOLS	33230	0.959	0.997	0.952	.	0.946	0.989	0.926	0.999	1.001	1.001	0.998
IONIA PUBLIC SCHOOLS	34010	1.028	0.973	1.009	.	1.038	0.981	1.011	1.006	0.991	1.009	0.988
BELDING AREA SCHOOL DISTRICT	34080	0.965	0.969	0.928	.	0.985	0.973	0.959	1.001	0.986	1.003	0.982
LAKEWOOD PUBLIC SCHOOLS	34090	0.998	0.972	0.989	.	1.019	0.977	1.013	0.992	0.988	0.987	0.984
PORTLAND PUBLIC SCHOOL DIST	34110	0.940	0.967	0.909	.	0.974	0.969	0.957	0.997	0.983	0.998	0.979
SARANAC COMM SCHOOL DISTRICT	34120	0.972	0.963	0.984	.	0.948	0.956	0.939	0.983	0.979	0.976	0.973
OSCODA AREA SCHOOLS	35010	1.014	0.935	0.970	0.887	1.011	0.953	0.972	1.000	0.975	1.001	0.983
HALE AREA SCHOOLS	35020	0.865	0.922	0.856	.	0.813	0.945	0.825	0.972	0.970	0.964	0.976
TAWAS AREA SCHOOLS	35030	0.882	0.927	0.845	.	0.933	0.948	0.919	0.988	0.971	0.983	0.978
WHITTEMORE PRESCOTT AREA S D	35040	0.930	0.925	0.909	.	0.962	0.957	0.990	0.980	0.976	0.974	0.984
FOREST PARK SCHOOL DISTRICT	36015	1.034	0.928	1.067	1.014	1.028	0.924	1.057	0.978	0.969	0.971	0.982
WEST IRON COUNTY SCHOOL DIST	36025	0.970	0.932	0.961	.	1.011	0.927	0.992	0.987	0.970	0.982	0.984
MT PLEASANT CITY SCHOOL DIST	37010	1.022	0.948	1.036	0.998	1.039	0.960	1.030	1.000	0.985	1.005	0.992
BEAL CITY SCHOOL DISTRICT	37040	0.868	0.931	0.867	.	0.825	0.934	0.840	0.966	0.972	0.957	0.976
SHEPHERD PUBLIC SCHOOL DIST	37060	0.901	0.936	0.885	.	0.928	0.935	0.912	0.983	0.972	0.978	0.976
WESTERN SCHOOL DISTRICT	38010	1.004	0.997	0.996	.	0.994	0.994	0.979	1.000	0.998	1.001	0.992
VANDERCOOK LAKE PUB SCH DIST	38020	0.971	0.993	0.968	.	0.968	0.997	0.971	0.998	1.000	0.999	0.994
COLUMBIA SCHOOL DISTRICT	38040	0.996	0.996	1.011	.	0.987	0.998	0.994	0.991	1.000	0.985	0.994
GRASS LAKE COMMUNITY SCHOOLS	38050	0.916	0.991	0.919	.	0.936	0.983	0.931	0.993	0.993	0.994	0.985
CONCORD COMMUNITY SCHOOLS	38080	0.953	0.992	0.977	.	0.930	1.004	0.958	0.984	1.004	0.977	0.998
EAST JACKSON PUBLIC SCHOOLS	38090	1.057	0.995	1.067	1.023	1.004	0.997	1.013	1.002	1.000	1.004	0.994
HANOVER HORTON SCHOOLS	38100	0.935	0.993	0.944	.	0.985	0.985	1.001	0.981	0.993	0.973	0.986
MICHIGAN CENTER SCHOOL DIST	38120	1.036	0.995	1.040	0.985	1.059	0.995	1.071	1.003	1.000	1.005	0.993
NAPOLEON SCHOOL DISTRICT	38130	0.973	0.995	0.971	.	0.948	0.997	0.945	1.000	1.001	1.001	0.994
NORTHWEST SCHOOL DISTRICT	38140	1.010	1.004	0.992	.	1.012	1.002	0.982	1.014	1.007	1.018	1.000
SPRINGPORT PUBLIC SCHOOL	38150	0.929	0.992	0.941	.	0.922	0.984	0.927	0.986	0.993	0.980	0.986
JACKSON PUBLIC SCHOOLS	38170	1.170	1.037	1.163	1.140	1.164	1.049	1.139	1.036	1.031	1.043	1.030
KALAMAZOO CITY SCH DIST	39010	1.147	1.043	1.142	1.127	1.174	1.066	1.175	1.037	1.040	1.044	1.043
CLIMAX SCOTTS COMM SCHOOLS	39020	0.894	0.984	0.909	.	0.893	0.975	0.898	0.980	0.989	0.972	0.983
COMSTOCK PUBLIC SCHOOLS	39030	1.075	0.994	1.082	.	1.054	0.992	1.045	1.008	0.998	1.011	0.994
GALESBURG AUGUSTA COMM S D	39050	1.008	0.988	1.006	.	1.043	0.985	1.050	0.997	0.996	0.998	0.991
GULL LAKE COMMUNITY SCHOOLS	39065	0.999	0.992	1.004	.	0.999	0.988	0.985	0.994	0.996	0.989	0.991
PARCHMENT SCHOOL DISTRICT	39130	1.058	0.990	1.066	.	1.027	0.985	1.021	1.002	0.995	1.004	0.990
PORTAGE PUBLIC SCHOOLS	39140	1.117	1.022	1.125	1.011	1.108	1.033	1.103	1.016	1.018	1.020	1.019
SCHOOLCRAFT COMM SCHOOLS	39160	0.899	0.984	0.912	.	0.874	0.983	0.886	0.982	0.994	0.975	0.989

DISTRICT NAME	NUMBER	UINDEX1	UINDEX2	UINDEX3	INDEXB	INDEX1	INDEX2	INDEX3	BRSBA	LBSBA	BRSMA	LBSMA
VICKSBURG COMMUNITY SCHOOLS	39170	1.004	0.992	1.010	.	1.008	0.995	1.009	0.996	1.000	0.992	0.996
SOUTH BOARDMAN AREA SCHOOL	40020	.	0.907	0.767	.	.	0.916	0.978	.	0.954	.	0.961
KALKASKA PUBLIC SCHOOLS	40040	0.884	0.912	0.845	.	0.947	0.929	0.943	0.979	0.961	0.972	0.969
GRAND RAPIDS CITY SCH DIST	41010	1.113	1.127	1.152	1.048	1.109	1.152	1.149	1.049	1.089	1.059	1.105
GODWIN HEIGHTS PUBLIC SCHS	41020	1.115	1.001	1.137	.	1.094	1.005	1.112	1.008	1.010	1.012	1.010
NORTHVIEW PUBLIC SCHOOL	41025	1.034	1.005	1.035	.	1.022	1.003	1.011	1.007	1.009	1.010	1.008
WYOMING PUBLIC SCHOOLS	41026	1.060	1.024	1.057	0.972	1.055	1.046	1.068	1.017	1.032	1.023	1.036
BYRON CENTER PUBLIC SCHOOLS	41040	0.961	0.998	0.976	0.907	0.955	0.989	0.960	0.994	1.002	0.991	1.000
CALEDONIA COMMUNITY SCHOOLS	41050	0.982	1.000	0.990	0.928	1.015	0.988	1.016	0.991	1.001	0.984	0.999
CEDAR SPRINGS PUBLIC SCHOOLS	41070	0.964	1.001	0.960	.	1.005	0.990	0.998	0.996	1.002	0.992	1.000
COMSTOCK PARK SCHOOL DIST	41080	1.033	0.998	1.034	.	0.997	0.996	0.987	1.005	1.005	1.008	1.004
E GR RAPIDS PUBLIC SCHOOLS	41090	1.115	1.003	1.139	.	1.104	0.998	1.090	0.993	1.006	0.991	1.005
FOREST HILLS PUBLIC SCHOOLS	41110	1.023	1.011	1.020	0.930	1.027	1.009	1.014	1.007	1.011	1.010	1.012
GODFREY LEE PUBLIC SCH DIST	41120	1.038	0.996	1.050	.	1.019	0.985	1.021	0.998	0.999	1.000	0.997
GRANDVILLE PUBLIC SCHOOLS	41130	1.037	1.008	1.032	.	1.031	1.005	1.016	1.012	1.009	1.017	1.009
KELLOGGSVILLE PUBLIC SCHOOLS	41140	1.060	1.001	1.063	.	1.024	0.995	1.022	1.006	1.006	1.010	1.004
KENOWA HILLS PUBLIC SCHOOLS	41145	1.026	1.005	1.020	.	1.002	1.003	0.988	1.010	1.008	1.014	1.008
KENT CITY COMMUNITY SCHOOLS	41150	0.893	0.997	0.888	.	0.876	0.985	0.880	0.992	0.999	0.988	0.997
KENTWOOD PUBLIC SCHOOLS	41160	1.025	1.021	1.015	0.900	1.011	1.015	0.983	1.013	1.015	1.017	1.016
LOWELL AREA SCHOOLS	41170	0.992	1.004	0.977	.	0.995	0.996	0.975	1.004	1.005	1.007	1.004
ROCKFORD PUBLIC SCHOOLS	41210	1.007	1.008	1.007	.	1.003	1.006	0.986	1.001	1.010	0.998	1.010
SPARTA AREA SCHOOLS	41240	1.016	1.002	1.011	.	1.020	0.999	1.010	1.007	1.007	1.011	1.006
BALDWIN PUBLIC SCHOOL DIST	43040	0.854	0.910	0.840	.	0.872	0.896	0.853	0.967	0.976	0.958	0.979
LAPEER PUBLIC SCHOOLS	44010	0.991	0.998	0.948	0.967	1.008	1.010	0.970	1.014	1.001	1.018	0.994
ALMONT COMMUNITY SCHOOLS	44020	0.930	0.972	0.927	.	0.966	0.976	0.967	0.985	0.983	0.978	0.973
DRYDEN COMMUNITY SCHOOLS	44050	0.942	0.969	0.950	.	0.931	0.977	0.951	0.976	0.984	0.968	0.974
IMLAY CITY COMMUNITY SCHOOLS	44060	0.991	0.976	0.991	.	0.960	0.991	0.951	0.992	0.991	0.986	0.982
NORTH BRANCH AREA SCHOOLS	44090	0.943	0.976	0.923	.	0.950	0.981	0.938	0.992	0.985	0.986	0.976
GLEN LAKE COMMUNITY SCH DIST	45010	0.958	0.928	0.962	.	0.950	0.934	0.971	0.973	0.968	0.965	0.977
LELAND PUBLIC SCHOOL DIST	45020	.	0.926	0.940	.	.	0.934	0.922	.	0.968	.	0.976
NORTHPORT PUBLIC SCHOOL DIST	45040	0.920	0.925	0.941	.	0.929	0.932	0.963	0.961	0.967	0.950	0.975
SUTTONS BAY PUBLIC SCH DIST	45050	0.917	0.927	0.923	.	0.909	0.943	0.934	0.973	0.973	0.965	0.982
ADRIAN CITY SCHOOL DISTRICT	46010	1.042	1.000	1.060	1.014	1.057	1.010	1.052	1.014	1.009	1.021	1.009
ADDISON COMMUNITY SCHOOLS	46020	0.928	0.982	0.933	.	0.950	0.975	0.949	0.987	0.990	0.981	0.987
BLISSFIELD COMMUNITY SCHOOLS	46040	1.034	0.984	1.041	.	1.013	0.985	1.005	1.001	0.996	1.003	0.993
BRITTON MACON AREA SCHOOL	46050	0.908	0.979	0.919	.	0.942	0.969	0.963	0.974	0.988	0.965	0.983
CLINTON COMMUNITY SCHOOLS	46060	0.923	0.982	0.942	.	0.933	0.979	0.947	0.981	0.993	0.973	0.989
DEERFIELD PUBLIC SCHOOLS	46070	0.921	0.979	0.964	.	0.873	0.981	0.913	0.971	0.994	0.962	0.991
HUDSON AREA SCHOOLS	46080	0.989	0.984	0.983	.	1.023	0.975	1.025	0.996	0.990	0.997	0.987
MADISON SCHOOL	46090	0.962	0.981	0.999	.	0.936	0.994	0.968	0.983	1.003	0.977	1.000
MORENCI AREA SCHOOLS	46100	0.969	0.981	0.992	.	0.975	0.980	0.997	0.983	0.994	0.976	0.990
ONSTED COMMUNITY SCHOOLS	46110	0.913	0.984	0.914	.	0.952	0.986	0.963	0.984	0.997	0.977	0.994
SAND CREEK COMMUNITY SCHOOLS	46130	0.957	0.980	0.986	.	0.966	0.980	0.994	0.983	0.994	0.977	0.990
TECUMSEH PUBLIC SCHOOLS	46140	1.060	0.991	1.063	0.982	1.052	0.998	1.052	1.004	1.003	1.006	1.001
BRIGHTON AREA SCHOOLS	47010	0.996	1.008	0.987	.	1.005	1.014	0.991	0.999	0.997	0.993	0.981
FOWLERVILLE COMMUNITY SCHS	47030	0.933	0.995	0.919	.	0.932	1.004	0.924	0.992	0.992	0.986	0.975
HARTLAND CONS SCHOOL	47060	0.920	0.998	0.899	.	0.945	1.000	0.932	0.991	0.989	0.984	0.972
HOWELL PUBLIC SCHOOLS	47070	1.008	1.011	0.977	0.951	1.023	1.024	0.995	1.013	1.002	1.015	0.987
PINCKNEY COMMUNITY SCHOOLS	47080	0.978	0.999	0.979	.	0.975	1.006	0.966	0.993	0.993	0.987	0.976
TAHQUAMENON AREA SCHOOLS	48040	0.966	0.937	0.951	.	1.002	0.933	0.980	0.984	0.970	0.977	0.979
ST IGNACE CITY SCHOOL DIST	49010	0.890	0.934	0.861	.	0.926	0.927	0.912	0.987	0.971	0.987	0.984
LES CHENEAUX COMM SCH DIST	49040	0.889	0.931	0.903	.	0.934	0.920	0.947	0.967	0.968	0.958	0.980
ENGADINE CONSOLIDATED SCHS	49055	0.925	0.932	0.936	.	0.920	0.919	0.936	0.967	0.967	0.957	0.979
MACKINAC ISLAND PUB SCH DIST	49110	.	0.931	0.845	.	.	0.918	0.790	.	0.967	.	0.979
CENTER LINE PUBLIC SCHOOLS	50010	1.172	1.137	1.237	1.059	1.157	1.132	1.208	1.035	1.044	1.045	1.039

DISTRICT NAME	NUMBER	UINDEX1	UINDEX2	UINDEX3	INDEXB	INDEX1	INDEX2	INDEX3	BRSBA	LBSBA	BRSMA	LBSMA
EAST DETROIT CITY SCH DIST	50020	1.184	1.158	1.248	1.089	1.161	1.166	1.214	1.044	1.061	1.055	1.059
ROSEVILLE COMMUNITY SCHOOLS	50030	1.223	1.162	1.292	1.121	1.189	1.170	1.249	1.044	1.064	1.055	1.063
ANCHOR BAY SCHOOL DISTRICT	50040	1.045	1.132	1.087	.	1.032	1.110	1.050	1.027	1.033	1.035	1.025
ARMADA AREA SCHOOLS	50050	1.035	1.122	1.104	.	1.020	1.097	1.063	1.006	1.026	1.004	1.017
CLINTONDALE PUBLIC SCHOOLS	50070	1.106	1.138	1.156	1.029	1.099	1.123	1.134	1.030	1.042	1.038	1.035
CHIPPEWA VALLEY SCHOOLS	50080	1.049	1.134	1.089	0.943	1.029	1.114	1.063	1.029	1.035	1.038	1.028
FITZGERALD PUBLIC SCHOOLS	50090	1.191	1.134	1.261	1.116	1.160	1.132	1.219	1.034	1.044	1.043	1.038
FRASER PUBLIC SCHOOLS	50100	1.132	1.146	1.186	0.993	1.084	1.135	1.115	1.036	1.045	1.045	1.048
LAKE SHORE PUBLIC SCHOOLS	50120	1.159	1.149	1.218	.	1.120	1.147	1.158	1.038	1.051	1.048	1.048
LAKEVIEW PUBLIC SCHOOLS	50130	1.179	1.140	1.246	.	1.124	1.143	1.173	1.036	1.050	1.045	1.045
L ANSE CREUSE PUBLIC SCHOOLS	50140	1.088	1.149	1.135	0.985	1.077	1.140	1.108	1.036	1.050	1.046	1.045
MT CLEMENS COMM SCHOOL DIST	50160	1.154	1.139	1.235	1.001	1.152	1.121	1.192	1.032	1.047	1.043	1.038
NEW HAVEN COMMUNITY SCHOOLS	50170	1.038	1.124	1.111	.	0.986	1.105	1.033	1.009	1.039	1.008	1.027
RICHMOND COMMUNITY SCHOOLS	50180	1.043	1.123	1.086	.	1.040	1.099	1.073	1.020	1.028	1.027	1.018
ROMEO COMMUNITY SCHOOLS	50190	1.083	1.135	1.126	1.006	1.096	1.117	1.125	1.027	1.038	1.035	1.030
SOUTH LAKE SCHOOLS	50200	1.175	1.133	1.245	1.060	1.140	1.123	1.184	1.031	1.039	1.040	1.033
UTICA COMMUNITY SCHOOLS	50210	1.138	1.213	1.225	1.019	1.108	1.216	1.175	1.047	1.085	1.059	1.098
VAN DYKE COMMUNITY SCHOOLS	50220	1.202	1.141	1.274	1.090	1.155	1.138	1.205	1.036	1.047	1.046	1.042
WARREN CONSOLIDATED SCHOOLS	50230	1.167	1.233	1.276	1.034	1.118	1.259	1.221	1.052	1.106	1.064	1.117
WARREN WOODS PUBLIC SCHOOLS	50240	.	1.149	1.155	.	.	1.145	1.101	.	1.050	.	1.046
BEAR LAKE SCHOOL	51020	1.000	0.933	1.022	0.829	0.900	0.955	0.929	0.969	0.971	0.960	0.972
KALEVA NORMAN-DICKSON SCHS	51045	0.937	0.933	0.929	.	0.945	0.949	0.963	0.976	0.969	0.968	0.970
ONEKEMA CONSOLIDATED SCHOOL	51060	0.956	0.933	0.943	.	0.944	0.945	0.945	0.976	0.965	0.967	0.964
MANISTEE CITY SCHOOLS	51070	1.002	0.940	0.957	0.991	1.015	0.961	0.992	1.000	0.974	1.002	0.976
NICE COMMUNITY SCHOOLS	52015	.	0.949	0.892	.	.	0.939	0.910	.	0.972	.	0.978
QUINN AREA COMMUNITY SCHOOLS	52040	1.056	0.956	1.044	.	1.037	0.953	1.009	1.005	0.982	1.008	0.989
NEGAUNEE SCHOOL DISTRICT	52090	1.064	0.951	1.062	.	1.117	0.950	1.123	1.002	0.978	1.005	0.985
REPUBLIC MICHIGAMME SCHOOLS	52110	0.949	0.944	0.980	.	0.988	0.934	1.024	0.975	0.969	0.967	0.973
MARQUETTE CITY SCHOOL DIST	52170	0.994	0.964	0.991	0.963	1.053	0.961	1.025	1.004	0.984	1.008	0.993
ISHPEMING PUBLIC SCHOOL DIST	52180	1.066	0.949	1.066	.	1.071	0.949	1.062	1.001	0.977	1.004	0.984
MASON CO CENTRAL SCHOOL DIST	53010	0.951	0.953	0.952	.	0.985	0.954	0.977	0.985	0.980	0.979	0.981
MASON CO EASTERN SCHOOL DIST	53020	0.928	0.949	0.942	.	0.938	0.954	0.965	0.976	0.981	0.968	0.981
FREESOIL COMM SCHOOL DIST	53030	.	0.946	0.872	.	.	0.940	0.849	.	0.973	.	0.972
LUDINGTON AREA SCHOOL DIST	53040	1.007	0.958	0.981	0.935	1.025	0.967	1.001	1.002	0.987	1.004	0.989
BIG RAPIDS PUBLIC SCHOOLS	54010	0.976	0.922	0.988	.	1.004	0.928	0.996	0.989	0.976	0.991	0.989
CHIPPEWA HILLS SCHOOL DIST	54025	0.950	0.923	0.937	.	0.956	0.927	0.947	0.984	0.976	0.980	0.988
MORLEY STANWOOD COMM SCHOOLS	54040	0.851	0.917	0.841	.	0.861	0.917	0.854	0.976	0.970	0.970	0.982
CARNEY NADEAU PUBLIC SCHOOLS	55010	0.826	0.923	0.828	.	0.806	0.909	0.810	0.968	0.965	0.961	0.981
MENOMINEE AREA PUBLIC SCHOOL	55100	0.988	0.934	0.987	1.000	1.010	0.927	0.986	1.000	0.974	1.005	0.991
NORTH-CENTRAL AREA SCHOOLS	55115	0.883	0.925	0.879	.	0.898	0.912	0.895	0.975	0.967	0.967	0.983
STEPHENSON AREA PUB SCHOOLS	55120	0.927	0.927	0.923	.	0.933	0.917	0.913	0.982	0.969	0.977	0.985
MIDLAND CITY SCHOOL DISTRICT	56010	1.135	1.048	1.157	1.045	1.167	1.078	1.168	1.019	1.021	1.023	1.003
BULLOCK CREEK SCHOOL DIST	56020	0.994	1.011	0.962	0.887	0.998	1.024	0.984	1.005	0.995	1.006	0.970
COLEMAN COMM SCHOOL DISTRICT	56030	0.993	1.008	0.993	.	0.929	1.016	0.920	0.993	0.991	0.986	0.965
MERIDIAN PUB SCHOOL DISTRICT	56050	0.965	1.010	0.946	.	0.961	1.018	0.944	0.995	0.991	0.989	0.966
LAKE CITY AREA SCHOOL DIST	57020	0.865	0.900	0.839	.	0.862	0.918	0.855	0.975	0.959	0.968	0.971
MCBAIN RURAL AG SCHOOL DIST	57030	0.907	0.898	0.897	.	0.844	0.909	0.846	0.973	0.954	0.966	0.965
MONROE CITY PUBLIC SCHOOLS	58010	1.089	1.034	1.109	1.045	1.096	1.049	1.096	1.024	1.021	1.032	1.013
AIRPORT COMM SCHOOL DISTRICT	58020	0.939	1.012	0.927	0.895	0.942	1.011	0.926	0.999	1.002	0.995	0.990
BEDFORD PUB SCHOOL DISTRICT	58030	1.068	1.026	1.062	0.974	1.048	1.038	1.032	1.017	1.015	1.021	1.006
DUNDEE COMM SCHOOL DISTRICT	58050	1.006	1.007	1.019	0.930	0.972	1.010	0.978	0.994	1.003	0.989	0.990
IDA PUBLIC SCHOOL DISTRICT	58070	0.994	1.008	1.004	.	0.991	1.038	1.023	0.996	1.017	0.992	1.006
JEFFERSON CONS SCHOOL DIST	58080	.	1.009	1.058	.	.	1.014	1.017	.	1.003	.	0.991
MASON CONS SCHOOL DISTRICT	58090	1.004	1.007	1.013	.	1.001	1.017	1.014	0.998	1.005	0.994	0.993
SUMMERFIELD SCHOOL DISTRICT	58100	0.967	1.005	0.990	.	0.957	1.005	0.979	0.990	0.998	0.984	0.985

DISTRICT NAME	NUMBER	UINDEX1	UINDEX2	UINDEX3	INDEXB	INDEX1	INDEX2	INDEX3	BRSDA	LBSDA	BRSMA	LBSMA
WHITEFORD AGRI SCHOOL DIST	58110	0.968	1.004	0.980	.	0.976	1.006	0.999	0.987	1.001	0.980	0.987
CARSON CITY CRYSTAL AREA S D	59020	0.977	0.951	0.987	.	0.961	0.957	0.968	0.984	0.985	0.978	0.988
MONTABELLA COMMUNITY S D	59045	0.935	0.951	0.938	.	0.958	0.951	0.951	0.983	0.982	0.977	0.985
GREENVILLE PUBLIC SCHOOLS	59070	0.985	0.959	0.961	.	0.997	0.962	0.976	1.000	0.987	1.002	0.992
TRI-CO AREA SCHOOLS	59080	0.895	0.951	0.887	.	0.908	0.954	0.908	0.982	0.984	0.976	0.987
LAKEVIEW COMM SCHOOLS	59090	0.953	0.952	0.948	.	0.954	0.960	0.956	0.986	0.984	0.980	0.990
CENTRAL MONTCALM PUB SCHOOLS	59125	0.937	0.952	0.940	.	0.967	0.964	0.977	0.985	0.989	0.980	0.993
VESTABURG COMMUNITY SCHOOLS	59150	0.890	0.948	0.900	.	0.932	0.957	0.959	0.977	0.985	0.970	0.989
ATLANTA COMMUNITY SCHOOLS	60010	0.884	0.898	0.873	.	0.895	0.922	0.916	0.967	0.961	0.959	0.973
HILLMAN COMMUNITY SCHOOLS	60020	0.979	0.899	0.979	.	0.994	0.929	1.039	0.972	0.965	0.964	0.978
MUSKEGON CITY SCHOOL DIST	61010	1.092	1.030	1.074	1.056	1.114	1.039	1.101	1.035	1.039	1.043	1.043
MUSKEGON HGTS CITY SCH DIST	61020	1.027	1.011	0.998	.	1.042	0.969	0.983	1.024	1.026	1.030	1.016
MONA SHORES SCHOOL DISTRICT	61060	1.048	1.012	1.068	1.021	1.084	1.012	1.074	1.012	1.016	1.016	1.020
OAKRIDGE SCHOOL DISTRICT	61065	0.947	0.998	0.940	.	0.973	0.996	0.976	1.003	1.009	1.006	1.011
FRUITPORT COMMUNITY SCHOOLS	61080	0.999	1.006	0.987	.	1.000	1.006	0.989	1.010	1.013	1.014	1.016
HOLTON PUBLIC SCHOOLS	61120	0.889	0.994	0.897	0.893	0.914	0.987	0.938	0.984	1.005	0.978	1.005
MONTAGUE AREA PUBLIC SCHOOLS	61180	0.994	0.997	1.014	.	0.984	0.996	0.993	0.991	1.009	0.986	1.010
ORCHARD VIEW SCHOOLS	61190	1.053	1.006	1.056	1.045	1.062	1.047	1.104	1.009	1.033	1.014	1.038
RAVENNA PUBLIC SCHOOLS	61210	0.970	0.995	0.991	.	0.986	0.987	1.006	0.987	1.004	0.982	1.005
REETHS PUFFER SCHOOLS	61220	1.019	1.007	1.012	0.941	0.996	0.998	0.972	1.008	1.012	1.012	1.013
NORTH MUSKEGON CITY SCH DIST	61230	1.002	0.994	1.026	.	1.037	0.979	1.050	0.984	1.000	0.982	1.000
WHITE HALL DIST SCHOOLS	61240	1.031	0.999	1.037	.	1.006	0.990	1.004	0.999	1.007	1.001	1.008
FREMONT PUBLIC SCHOOL DIST	62040	0.987	0.948	0.962	.	1.000	0.961	0.983	0.999	0.984	1.001	0.987
GRANT PUBLIC SCHOOL DISTRICT	62050	0.895	0.944	0.880	.	0.871	0.947	0.845	0.985	0.977	0.979	0.978
HESPERIA COMM SCHOOL DIST	62060	0.920	0.942	0.917	.	0.899	0.955	0.904	0.980	0.982	0.974	0.984
NEWAYGO PUBLIC SCHOOL DIST	62070	0.930	0.942	0.922	.	0.964	0.938	0.955	0.981	0.971	0.974	0.972
WHITE CLOUD PUBLIC SCHOOLS	62090	0.880	0.943	0.864	0.809	0.833	0.930	0.813	0.980	0.976	0.974	0.975
BIRMINGHAM CITY SCHOOL DIST	63010	1.239	1.148	1.341	1.062	1.255	1.166	1.321	1.028	1.050	1.036	1.042
FERNDALE CITY SCHOOL DIST	63020	1.208	1.127	1.254	1.104	1.199	1.126	1.244	1.029	1.035	1.036	1.021
PONTIAC CITY SCHOOL DISTRICT	63030	1.160	1.108	1.200	1.186	1.228	1.185	1.270	1.061	1.073	1.073	1.064
ROYAL OAK CITY SCHOOL DIST	63040	1.176	1.152	1.221	1.067	1.170	1.175	1.214	1.037	1.054	1.045	1.048
BERKLEY CITY SCHOOL DISTRICT	63050	1.164	1.124	1.212	1.102	1.171	1.129	1.210	1.028	1.032	1.034	1.020
SOUTHFIELD PUBLIC SCH DIST	63060	1.172	1.150	1.232	1.002	1.141	1.167	1.183	1.033	1.050	1.040	1.043
AVONDALE SCHOOL DISTRICT	63070	1.109	1.113	1.143	.	1.081	1.114	1.110	1.023	1.025	1.029	1.011
BLOOMFIELD HILLS SCHOOL DIST	63080	1.158	1.131	1.216	1.029	1.218	1.141	1.262	1.020	1.039	1.023	1.027
CLARENCEVILLE SCHOOL DIST	63090	1.138	1.111	1.190	0.934	1.096	1.112	1.134	1.017	1.024	1.021	1.009
NOVI COMMUNITY SCHOOL DIST	63100	1.036	1.109	1.063	.	1.024	1.096	1.050	1.014	1.015	1.018	0.999
OXFORD AREA COMM SCHOOL DIST	63110	1.046	1.111	1.062	.	1.063	1.102	1.082	1.021	1.019	1.027	1.003
HAZEL PARK CITY SCHOOL DIST	63130	1.188	1.131	1.233	1.172	1.189	1.143	1.244	1.037	1.040	1.046	1.029
MADISON HEIGHTS SCHOOL DIST	63140	1.116	1.114	1.147	1.023	1.078	1.111	1.102	1.028	1.023	1.036	1.009
TROY PUBLIC SCHOOLS	63150	1.057	1.136	1.078	0.955	1.085	1.130	1.098	1.025	1.032	1.031	1.020
WEST BLOOMFIELD TWP SCH DIST	63160	1.093	1.121	1.127	0.954	1.049	1.119	1.059	1.023	1.027	1.028	1.014
BRANDON SCHOOL DISTRICT	63180	0.967	1.108	1.006	0.919	0.993	1.100	1.026	1.007	1.018	1.004	1.002
CLARKSTON COMM SCHOOL DIST	63190	1.051	1.125	1.092	0.995	1.054	1.122	1.079	1.021	1.029	1.021	1.016
FARMINGTON PUB SCHOOL DIST	63200	1.181	1.155	1.246	1.014	1.157	1.173	1.204	1.032	1.054	1.038	1.047
HOLLY AREA SCHOOL DISTRICT	63210	1.081	1.115	1.112	.	1.082	1.107	1.106	1.025	1.022	1.031	1.007
HURON VALLEY SCHOOLS	63220	1.081	1.136	1.109	1.006	1.073	1.135	1.094	1.032	1.035	1.040	1.023
LAKE ORION COMM SCHOOL DIST	63230	1.050	1.122	1.068	0.985	1.041	1.117	1.045	1.032	1.026	1.040	1.012
SO LYON COMMUNITY SCHOOLS	63240	1.070	1.114	1.102	.	1.027	1.110	1.053	1.022	1.024	1.028	1.009
OAK PARK CITY SCHOOL DIST	63250	1.247	1.116	1.317	1.122	1.228	1.117	1.283	1.025	1.030	1.031	1.015
ROCHESTER COMM SCHOOL DIST	63260	1.141	1.137	1.182	1.031	1.130	1.135	1.155	1.030	1.035	1.037	1.024
CLAWSON CITY SCHOOL DISTRICT	63270	1.100	1.114	1.135	0.960	1.057	1.114	1.071	1.027	1.025	1.034	1.011
LAMPHERE PUBLIC SCHOOLS	63280	1.163	1.116	1.213	1.009	1.105	1.120	1.133	1.027	1.028	1.033	1.014
WALLED LAKE CONS SCHOOL DIST	63290	1.161	1.142	1.185	1.041	1.128	1.144	1.157	1.033	1.039	1.041	1.029
WATERFORD SCHOOL DISTRICT	63300	1.161	1.165	1.213	1.052	1.157	1.183	1.211	1.042	1.059	1.052	1.033

DISTRICT NAME	NUMBER	UINDEX1	UINDEX2	UINDEX3	INDEXB	INDEX1	INDEX2	INDEX3	BRSBA	LBSBA	BRSMA	LBSMA
HART PUBLIC SCHOOL DISTRICT	64040	0.915	0.948	0.898	.	0.916	0.953	0.901	0.983	0.981	0.976	0.983
PENTWATER PUBLIC SCHOOL DIST	64070	0.858	0.941	0.883	.	0.883	0.935	0.915	0.960	0.971	0.949	0.972
SHELBY PUBLIC SCHOOL DIST	64080	0.956	0.947	0.954	0.889	0.951	0.953	0.945	0.983	0.981	0.977	0.983
WALKERVILLE COMM SCHOOL DIST	64090	0.787	0.941	0.777	.	0.813	0.935	0.835	0.966	0.971	0.957	0.972
W BRANCH ROSE CITY AREA SCHS	65045	0.941	0.911	0.895	.	0.936	0.934	0.909	0.987	0.963	0.981	0.971
BERGLAND COMM SCHOOL DIST	66010	.	0.941	0.777	.	.	0.931	0.786	.	0.968	.	0.974
EWEN TROUT CREEK CONS S D	66045	0.918	0.943	0.921	.	0.937	0.953	0.961	0.978	0.981	0.971	0.989
ONTONAGON AREA SCHOOLS	66050	0.948	0.947	0.931	.	0.953	0.946	0.942	0.982	0.976	0.975	0.984
WHITE PINE SCHOOL DISTRICT	66070	0.949	0.942	0.978	.	0.967	0.933	0.980	0.968	0.969	0.958	0.975
EVART PUBLIC SCHOOL	67020	0.906	0.934	0.900	.	0.942	0.937	0.948	0.978	0.976	0.972	0.982
MARION PUBLIC SCHOOL	67050	0.930	0.932	0.947	.	.	0.932	.	0.976	0.973	0.969	0.979
PINE RIVER AREA SCHOOLS	67055	0.900	0.934	0.887	.	.	0.943	.	0.977	0.979	0.970	0.986
REED CITY PUBLIC SCHOOLS	67060	0.912	0.937	0.903	.	0.978	0.938	0.963	0.984	0.976	0.978	0.983
MIO AU SABLE SCHOOL DISTRICT	68010	0.884	0.914	0.852	.	0.903	0.936	0.910	0.974	0.963	0.966	0.968
FAIRVIEW HIGH SCHOOL DIST	68030	0.922	0.911	0.916	.	0.907	0.924	0.923	0.970	0.956	0.962	0.961
GAYLORD COMM SCHOOLS	69020	0.971	0.928	0.925	.	0.968	0.944	0.937	0.993	0.967	0.993	0.972
JOHANNESBURG-CENTRAL SCHOOL	69030	0.868	0.920	0.843	.	0.898	0.931	0.897	0.973	0.960	0.965	0.964
VANDERBILT-AREA SCHOOL	69040	0.859	0.919	0.854	.	0.872	0.944	0.912	0.967	0.968	0.958	0.973
GRAND HAVEN CITY SCHOOL DIST	70010	1.039	1.002	1.056	1.019	1.052	1.015	1.054	1.014	1.011	1.021	1.010
HOLLAND CITY SCHOOL DISTRICT	70020	1.021	0.999	1.035	1.042	1.075	1.016	1.078	1.014	1.012	1.020	1.011
ALLENDALE PUBLIC SCHOOL DIST	70040	0.864	0.981	0.869	.	0.879	0.972	0.889	0.978	0.989	0.970	0.983
WEST OTTAWA PUB SCHOOL DIST	70070	1.046	0.996	1.031	.	1.043	1.001	1.026	1.009	1.004	1.013	1.002
COOPERSVILLE PUBLIC SCH DIST	70120	0.959	0.988	0.963	.	0.984	0.983	0.980	0.994	0.994	0.990	0.990
JENISON PUBLIC SCHOOLS	70175	0.977	0.997	0.954	.	0.968	0.993	0.936	1.008	0.999	1.011	0.996
HUDSONVILLE PUB SCHOOL DIST	70190	0.992	0.988	0.978	.	0.994	0.987	0.987	1.004	0.997	1.007	0.993
SPRING LAKE PUBLIC SCH DIST	70300	1.023	0.988	1.014	0.966	1.028	0.986	1.017	1.002	0.996	1.004	0.992
ZEELAND PUBLIC SCHOOL DIST	70350	0.987	0.988	0.969	.	1.004	0.986	0.988	1.005	0.996	1.008	0.992
ONAWAY AREA COMM SCHOOL DIST	71050	0.951	0.928	0.920	.	0.944	0.951	0.934	0.982	0.968	0.976	0.969
POSEN CONS SCHOOL DISTRICT	71060	0.900	0.924	0.889	.	0.900	0.937	0.928	0.970	0.960	0.961	0.960
ROGERS UNION SCHOOL DISTRICT	71080	1.069	0.928	1.050	1.006	1.050	0.951	1.047	0.992	0.968	0.993	0.969
GERRISH HIGGINS SCHOOL DIST	72010	0.938	0.917	0.916	.	0.951	0.943	0.951	0.979	0.967	0.971	0.973
HOUGHTON LAKE COMMUNITY SCHS	72020	0.918	0.917	0.883	.	0.970	0.942	0.967	0.985	0.966	0.979	0.973
SAGINAW CITY SCHOOL DISTRICT	73010	1.144	1.070	1.139	1.136	1.162	1.090	1.157	1.046	1.036	1.055	1.053
CARROLLTON SCHOOL DISTRICT	73030	0.965	1.003	0.952	.	0.945	1.008	0.934	1.006	1.005	1.009	0.995
SAGINAW TWP COMM SCHOOLS	73040	1.043	1.023	1.035	0.947	1.059	1.033	1.041	1.013	1.014	1.016	1.008
BUENA VISTA SCHOOL DISTRICT	73080	1.033	1.009	1.024	.	1.027	1.001	1.004	1.009	1.017	1.013	1.001
CHESANING UNION SCHOOLS	73110	0.977	1.008	0.947	0.966	1.009	1.011	0.985	1.012	1.003	1.017	0.994
BIRCH RUN AREA SCHOOL DIST	73170	0.939	1.004	0.924	.	0.957	1.014	0.955	0.997	1.006	0.993	0.997
BRIDGEPORT COMM SCHOOL DIST	73180	1.011	1.013	0.992	0.952	1.020	1.022	1.004	1.015	1.009	1.019	1.001
FRANKENMUTH SCHOOL DISTRICT	73190	0.985	0.999	0.980	.	0.964	0.992	0.952	0.997	0.993	0.998	0.982
FREELAND COMM SCHOOL DIST	73200	0.948	0.999	0.944	.	1.001	0.998	1.006	0.990	0.996	0.984	0.986
HEMLOCK PUBLIC SCHOOL DIST	73210	0.939	1.001	0.931	.	0.936	0.995	0.926	0.992	0.995	0.986	0.984
MERRILL COMM SCHOOL DISTRICT	73230	0.900	0.999	0.899	0.945	0.964	1.004	0.972	0.993	1.000	0.989	0.990
ST CHARLES COMM SCHOOL DIST	73240	0.958	1.000	0.944	0.882	0.923	1.001	0.915	0.992	0.998	0.987	0.988
SWAN VALLEY SCHOOL DISTRICT	73255	0.975	1.003	0.948	0.871	0.948	1.012	0.932	1.003	1.004	1.005	0.995
PORT HURON AREA SCHOOL DIST	74010	1.062	1.031	1.076	1.031	1.065	1.053	1.067	1.024	1.025	1.032	1.024
ALGONAC COMM SCHOOL DISTRICT	74030	0.994	0.983	0.965	.	0.972	0.987	0.938	1.005	0.989	1.007	0.981
CAPAC COMM SCHOOL DISTRICT	74040	0.961	0.977	0.961	.	1.011	0.979	1.027	0.988	0.986	0.982	0.977
EAST CHINA TWP SCHOOL DIST	74050	1.057	0.990	1.038	0.998	1.043	0.993	1.015	1.010	0.992	1.013	0.985
MARYSVILLE PUB SCHOOL DIST	74100	1.056	0.979	1.042	.	1.049	0.981	1.037	1.002	0.987	1.004	0.978
MEMPHIS COMMUNITY SCHOOLS	74120	0.916	0.975	0.907	.	0.925	0.976	0.925	0.985	0.985	0.978	0.975
YALE PUBLIC SCHOOL DISTRICT	74130	0.939	0.979	0.920	.	0.940	0.983	0.920	0.994	0.988	0.990	0.979
STURGIS CITY SCHOOL DISTRICT	75010	1.064	0.983	1.073	.	1.079	0.990	1.094	1.002	1.002	1.004	1.003
BURR OAK COMM SCHOOL DIST	75020	0.891	0.970	0.917	.	0.882	0.961	0.898	0.975	0.986	0.968	0.985
CENTREVILLE PUB SCHOOL DIST	75030	0.897	0.973	0.912	.	0.903	0.972	0.920	0.974	0.994	0.966	0.993

DISTRICT NAME	NUMBER	UINDEX1	UINDEX2	UINDEX3	INDEXB	INDEX1	INDEX2	INDEX3	BRSBA	LBSBA	BRSMA	LBSMA
COLON COMMUNITY SCHOOL DIST	75040	0.875	0.973	0.882	0.896	0.925	0.972	0.937	0.981	0.992	0.978	0.992
CONSTANTINE PUB SCHOOL DIST	75050	0.884	0.976	0.885	0.896	0.914	0.977	0.923	0.987	0.995	0.981	0.995
MENDON COMMUNITY SCHOOL DIST	75060	0.860	0.973	0.866	0.797	0.856	0.974	0.869	0.978	0.994	0.970	0.994
WHITE PIGEON COMM SCH DIST	75070	0.948	0.975	0.962	.	0.928	0.982	0.948	0.985	0.998	0.979	0.998
THREE RIVERS PUBLIC SCH DIST	75080	1.022	0.984	1.023	0.939	1.015	0.983	1.013	1.001	1.001	1.003	1.001
BROWN CITY COMM SCHOOL DIST	76040	0.885	0.945	0.875	.	0.881	0.940	0.863	0.984	0.973	0.978	0.974
CARSONVILLE COMM SCHOOL DIST	76070	0.880	0.943	0.885	.	0.868	0.938	0.875	0.977	0.972	0.969	0.973
CROSWELL LEXINGTON COMM S D	76080	0.975	0.951	0.968	.	0.987	0.947	0.964	0.989	0.977	0.984	0.979
DECKERVILLE COMM SCHOOL DIST	76090	0.903	0.945	0.892	0.927	0.936	0.939	0.936	0.980	0.973	0.973	0.974
MARLETTE COMM SCHOOL DIST	76140	0.936	0.947	0.918	.	0.952	0.943	0.932	0.983	0.975	0.976	0.977
PECK COMMUNITY SCHOOL	76180	0.833	0.942	0.834	0.771	0.816	0.936	0.809	0.975	0.972	0.968	0.972
SANDUSKY COMM SCHOOL DIST	76210	0.950	0.947	0.945	.	0.974	0.943	0.965	0.985	0.975	0.980	0.976
MANISTIQUE AREA SCHOOLS	77010	0.957	0.933	0.916	.	0.982	0.931	0.948	0.995	0.971	0.997	0.983
BYRON AREA SCHOOLS	78020	0.924	0.987	0.933	.	0.930	0.984	0.935	0.984	0.991	0.977	0.983
DURAND AREA SCHOOLS	78030	0.991	0.996	0.974	.	0.969	1.000	0.951	1.007	0.999	1.018	0.993
LAINGSBURG COMM SCHOOL DIST	78040	0.882	0.987	0.884	.	0.884	0.990	0.899	0.983	0.995	0.976	0.987
MORRICE AREA SCHOOLS	78060	0.902	0.986	0.907	.	0.876	0.988	0.888	0.980	0.994	0.972	0.986
NEW LOTHROP AREA PUB S D	78070	0.895	0.988	0.894	.	0.899	0.983	0.898	0.987	0.992	0.981	0.984
PERRY PUBLIC SCHOOL DISTRICT	78080	0.911	0.991	0.903	.	0.940	0.994	0.937	0.988	0.997	0.982	0.990
CORUNNA PUBLIC SCHOOL DIST	78100	0.967	0.994	0.939	0.914	0.986	0.998	0.969	1.005	0.999	1.007	0.992
OWOSSO PUBLIC SCHOOL DIST	78110	1.046	1.007	1.058	1.006	1.051	1.020	1.039	1.015	1.009	1.022	1.006
AKRON FAIRGROVE SCHOOLS	79010	0.925	0.969	0.925	.	0.945	0.973	0.958	0.982	0.987	0.974	0.983
CARO COMMUNITY SCHOOLS	79020	1.002	0.977	0.982	.	1.013	0.985	0.999	1.001	0.995	1.003	0.991
CASS CITY PUBLIC SCHOOLS	79030	0.901	0.973	0.885	.	0.939	0.975	0.927	0.989	0.988	0.983	0.984
KINGSTON COMMUNITY SCHOOLS	79080	0.862	0.969	0.859	.	0.916	0.980	0.940	0.981	0.991	0.974	0.987
MAYVILLE COMMUNITY SCHOOLS	79090	0.880	0.971	0.865	.	0.928	0.975	0.932	0.985	0.988	0.978	0.984
MILLINGTON COMMUNITY SCHOOLS	79100	0.915	0.975	0.892	.	0.933	0.979	0.914	0.992	0.990	0.987	0.986
REESE PUBLIC SCHOOLS	79110	0.870	0.970	0.868	.	0.879	0.975	0.886	0.986	0.988	0.980	0.984
SEBEWAING UNIONVILLE SCHOOLS	79145	0.966	0.970	0.968	.	0.988	0.972	0.997	0.985	0.987	0.978	0.982
VASSAR PUBLIC SCHOOLS	79150	0.965	0.975	0.937	0.948	1.006	0.980	0.988	1.001	0.992	1.003	0.988
SOUTH HAVEN PUBLIC SCHOOLS	80010	1.014	0.983	1.019	.	0.996	0.970	0.975	1.002	1.002	1.004	1.004
BANGOR PUBLIC SCHOOLS	80020	0.959	0.976	0.976	.	0.958	0.964	0.963	0.984	0.997	0.977	0.999
COVERT PUBLIC SCHOOLS	80040	0.880	0.977	0.903	.	0.843	0.940	0.835	0.974	1.010	0.965	1.002
DECATUR PUBLIC SCHOOLS	80050	0.973	0.974	1.010	.	0.966	0.965	0.984	0.983	0.996	0.977	0.998
BLOOMINGDALE PUB SCHOOL DIST	80090	0.901	0.978	0.914	.	0.898	0.960	0.898	0.984	0.997	0.978	0.998
GOBLES PUBLIC SCHOOL DIST	80110	0.879	0.972	0.896	.	0.897	0.959	0.902	0.976	0.990	0.968	0.992
HARTFORD PUBLIC SCHOOL DIST	80120	0.924	0.974	0.923	.	0.912	0.979	0.913	0.996	1.000	0.998	1.005
LAWRENCE PUBLIC SCHOOL DIST	80130	0.886	0.971	0.901	.	0.878	0.953	0.879	0.975	0.990	0.967	0.991
LAWTON COMMUNITY SCHOOL DIST	80140	0.896	0.971	0.917	.	0.913	0.965	0.936	0.976	0.993	0.968	0.996
MATTAWAN CONS SCHOOL DIST	80150	0.944	0.978	0.963	.	0.929	0.962	0.930	0.981	0.991	0.974	0.994
PAW PAW PUBLIC SCHOOL DIST	80160	0.983	0.977	0.990	.	0.975	0.976	0.981	0.995	0.999	0.996	1.003
ANN ARBOR CITY SCHOOL DIST	81010	1.221	1.051	1.245	1.076	1.223	1.071	1.226	1.030	1.037	1.033	1.039
YPSILANTI CITY SCHOOL DIST	81020	1.089	1.012	1.092	1.080	1.104	1.018	1.099	1.010	1.017	1.013	1.010
CHELSEA SCHOOL DISTRICT	81040	1.046	0.991	1.046	.	1.014	0.991	1.004	1.003	0.995	1.005	0.988
DEXTER COMMUNITY SCHOOL DIST	81050	1.013	0.989	1.011	.	1.023	0.989	1.019	0.998	0.994	0.999	0.987
LINCOLN CONS SCHOOL DISTRICT	81070	1.002	0.993	0.988	.	1.007	0.987	1.000	1.004	0.999	1.006	0.989
MANCHESTER PUB SCHOOL DIST	81080	0.966	0.986	0.984	.	0.984	0.984	0.992	0.986	0.991	0.980	0.983
MILAN AREA SCHOOLS	81100	1.009	0.993	1.003	.	1.012	0.990	1.001	1.008	1.000	1.011	0.991
SALINE AREA SCHOOL DISTRICT	81120	1.040	0.994	1.040	.	1.022	0.993	1.013	1.003	0.997	1.005	0.990
WHITMORE LAKE PUB SCH DIST	81140	0.915	0.985	0.901	.	0.920	0.984	0.918	0.993	0.993	0.993	0.984
WILLOW RUN PUBLIC SCHOOLS	81150	1.022	0.999	1.009	0.976	1.020	0.993	1.004	1.008	1.004	1.011	0.995
DETROIT CITY SCHOOL DISTRICT	82010	1.420	1.190	1.358	1.274	1.303	1.103	1.227	1.125	1.116	1.160	1.139
ALLEN PARK PUBLIC SCHOOLS	82020	1.291	1.135	1.311	1.092	1.222	1.120	1.235	1.066	1.060	1.091	1.075
CHERRY HILL SCHOOL DISTRICT	82025	1.231	1.133	1.250	1.034	1.124	1.108	1.125	1.059	1.056	1.083	1.069
DEARBORN CITY SCHOOL DIST	82030	1.378	1.185	1.420	1.275	1.370	1.190	1.427	1.079	1.095	1.106	1.118

DISTRICT NAME	NUMBER	UINDEX1	UINDEX2	UINDEX3	INDEXH	INDEX1	INDEX2	INDEX3	WRSBA	LBSBA	BRSMA	LBSMA
DEARBORN HEIGHTS SCH DIST 7	82040	1.201	1.135	1.192	1.019	1.131	1.115	1.125	1.065	1.058	1.090	1.071
MELVINDALE N ALLEN PK S D	82045	1.278	1.135	1.208	1.169	1.207	1.108	1.212	1.064	1.054	1.089	1.067
GARDEN CITY SCHOOL DISTRICT	82050	1.252	1.158	1.209	1.115	1.202	1.149	1.222	1.078	1.074	1.107	1.092
GROSSE PTE PUBLIC SCHOOLS	82055	.	1.160	1.357	.	.	1.147	1.347	.	1.073	.	1.091
HAMTRAMCK CITY SCHOOLS	82060	1.312	1.128	1.301	.	1.264	1.095	1.259	1.074	1.056	1.099	1.065
HIGHLAND PARK CITY SCHOOLS	82070	1.213	1.153	1.190	1.060	1.205	1.077	1.138	1.081	1.070	1.107	1.071
INKSTER CITY SCHOOL DISTRICT	82080	1.183	1.142	1.196	1.129	1.186	1.060	1.144	1.062	1.070	1.089	1.066
LINCOLN PARK CITY SCHOOLS	82090	1.311	1.151	1.320	1.234	1.264	1.136	1.279	1.073	1.068	1.100	1.084
LIVONIA PUBLIC SCHOOLS	82095	1.295	1.234	1.302	1.053	1.246	1.258	1.336	1.084	1.128	1.114	1.159
PLYMOUTH COMMUNITY SCH DIST	82100	1.181	1.168	1.209	1.064	1.180	1.136	1.184	1.071	1.069	1.098	1.085
REDFORD UNION SCHOOL DIST	82110	1.267	1.146	1.273	1.097	1.197	1.129	1.193	1.070	1.064	1.096	1.080
RIVER ROUGE CITY SCHOOLS	82120	1.302	1.135	1.315	1.218	1.238	1.086	1.236	1.061	1.061	1.086	1.067
ROMULUS COMMUNITY SCHOOLS	82130	1.155	1.145	1.163	1.094	1.145	1.111	1.144	1.068	1.063	1.096	1.074
SOUTH REDFORD SCHOOL DIST	82140	1.305	1.138	1.322	1.136	1.232	1.121	1.242	1.067	1.060	1.092	1.075
TAYLOR SCHOOL DISTRICT	82150	1.249	1.198	1.271	1.151	1.214	1.189	1.242	1.083	1.097	1.111	1.119
TRENTON PUBLIC SCHOOLS	82155	1.249	1.143	1.258	1.062	1.182	1.122	1.178	1.066	1.061	1.091	1.076
WAYNE WESTLAND COMM SCHOOLS	82160	1.231	1.203	1.252	1.112	1.200	1.201	1.237	1.080	1.100	1.107	1.125
WYANDOTTE CITY SCHOOL DIST	82170	1.256	1.144	1.282	1.165	1.229	1.130	1.248	1.073	1.066	1.102	1.081
FLAT ROCK COMMUNITY SCHOOLS	82180	1.212	1.123	1.229	.	1.137	1.087	1.148	1.055	1.045	1.078	1.056
NORTH DEARBORN HGTS SCH DIST	82220	1.195	1.125	1.207	.	1.124	1.091	1.122	1.054	1.046	1.076	1.057
CRESTWOOD SCHOOL DISTRICT	82230	1.102	1.134	1.077	1.014	1.149	1.109	1.139	1.061	1.054	1.084	1.068
WESTWOOD COMMUNITY SCHOOLS	82240	1.198	1.135	1.192	1.039	1.161	1.099	1.146	1.061	1.059	1.085	1.068
ECORSE PUBLIC SCHOOL DIST	82250	1.375	1.135	1.406	1.235	1.272	1.075	1.267	1.062	1.062	1.087	1.064
GIBRALTAR SCHOOL DISTRICT	82290	1.118	1.134	1.091	0.976	1.084	1.098	1.061	1.061	1.049	1.085	1.061
GROSSE ILE TOWNSHIP SCHOOLS	82300	1.174	1.127	1.175	.	1.126	1.095	1.117	1.045	1.048	1.064	1.059
HARPER WOODS CITY SCH DIST	82320	1.175	1.123	1.186	.	1.231	1.086	1.247	1.052	1.043	1.075	1.054
HURON SCHOOL DISTRICT	82340	1.185	1.134	1.183	1.053	1.136	1.100	1.159	1.055	1.052	1.078	1.063
WOODHAVEN SCHOOL DISTRICT	82365	1.091	1.132	1.057	.	1.063	1.090	1.049	1.055	1.045	1.078	1.056
NORTHVILLE PUBLIC SCHOOLS	82390	1.183	1.143	1.109	.	1.119	1.090	1.095	1.055	1.049	1.078	1.059
RIVERVIEW COMMUNITY SCH DIST	82400	1.220	1.131	1.222	1.044	1.149	1.101	1.143	1.060	1.051	1.084	1.063
SOUTHGATE COMM SCHOOL DIST	82405	1.264	1.147	1.268	1.085	1.201	1.131	1.201	1.072	1.065	1.098	1.081
VAN BUREN PUBLIC SCHOOLS	82430	1.180	1.149	1.168	.	1.100	1.121	1.075	1.068	1.064	1.093	1.077
CADILLAC AREA PUBLIC SCHOOLS	83010	1.014	0.933	0.965	.	1.015	0.959	0.987	1.002	0.974	1.005	0.981
MANTON CONSOLIDATED SCH DIST	83060	0.842	0.920	0.813	.	0.903	0.940	0.908	0.972	0.965	0.963	0.970
MESICK CONSOLIDATED SCH DIST	83070	0.925	0.920	0.920	.	0.933	0.943	0.954	0.974	0.967	0.966	0.972

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SCHOOL FINANCE AND TAX REFORM IN NEVADA*

I

INTRODUCTION

The past decade has witnessed a major reform movement to reduce inequality in support of schools. For various reasons, reform actions peaked in 1973-74 and have slowed since. One of the major reasons for the slowing of the movement was the disappearance of state budget surpluses due to the national recession. "Every state which saw significant reform either had a budget surplus or available revenue sharing money to cover the cost of reform."[1] Reforms were implemented by leveling-up with additional state aid to local districts rather than redistribution from wealthy to low-wealth districts or by tapping new revenue sources. Not only did the movement peak, but there was also a change in the nature of the process from an emphasis on equalization to accountability and expenditure limits.[2]

Early attempts in the 1960's to initiate reform by referendum or initiative popular votes failed. Several reform groups, including the Ford Foundation and the League of Women Voters, have used the judicial system successfully as the mechanism to bring about the reform of school finance. The coupling of budget surpluses with popular dissatisfaction with the local property tax also made legislatures more disposed to enact reform.

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*Glen W. Atkinson and Thomas A. Sears, University of Nevada, Reno, Nevada

> "This (property tax system) worked very well on the small town level, as long as a heterogenous school district included the homes of both rich and poor and local industry as well as tax-free public and church land. But the suburban migration patterns of American Society in the last half-century slowly but surely eroded the equity of that system, not within a single community taken separately but when comparing one community with another nearby."[3]

The system began to fail with the suburbanization of affluent residences and declining property values in the central city. Slum neighborhoods cannot provide equal education for the residents, even at higher tax rates compared to affluent neighboring school districts. The inclusion of central city industrial property does not erase the inequity if the property tax must finance more expensive city services.[4] Actually, central city districts spend more per pupil than suburban or rural districts. This may be due to higher costs and needs in central city schools.[5] More recently, however, industry has been moving to the suburbs as well.

Most of the reform action has been at the state level rather than through the Federal Government. The first significant result was the Serrano v. Priest decision in 1971 by the California Supreme Court. That court declared that a child's education could not be a function of the wealth of his parents and neighbors. The U.S. Supreme Court, on the other hand, ruled in the 1973 case of Rodriguez v. San Antonio that the state education laws that benefit districts "unevenly" do not violate the Federal Constitution.

Given the composition of the current court, it is unlikely that the Federal position will be reversed in the near future.[6] Since education provision and finance are not explicitly stated as Federal functions nor forbidden to the states, they automatically fall under state jurisdiction according to the 10th Amendment to the Constitution.

In addition to the equity issue raised by the Serrano-type reform, there are efficiency arguments for more equality because of the external or neighborhood benefits from education. It not only benefits the student to receive education, it is also beneficial to the community to have an educated population. But what is the community? Is it a single school district, a county, a metropolitan region, or the state? Until the depression, education was primarily a local function. The effects of the depression on property values made it impossible to support education solely from the property tax. Moreover, shortly before the depression a state minimum foundation program was advocated by George D. Strayer and Robert M. Haig in a report prepared for the State of New York.[7] Under the minimum foundation provision each local school district is required to tax itself at some state-established minimum level, and the state would contribute to fill the gap between the minimum program cost and the local mandatory revenues. This would still allow inequality because local districts could choose to provide more than a minimum program. This tendency toward state funding and control of public education will be exacerbated with the spread of

Serrano-type reforms. This is a recognition that the more mobile the population, the more widespread the external benefits, i.e., the larger the community.

One study of the effects of the school finance reform movement between 1970 and 1975 concluded that on a nationwide basis overall expenditure disparities which were severe in 1970 had not decreased by 1975, and possibly increased. However, wealth-related disparities did decrease slightly between 1970 and 1975. For reform states only expenditure disparities were reduced slightly, with more substantial leveling for disparities due to local wealth.[8]

A later reform movement concerning the local property tax system is the revision of state constitutions and statutes to limit the property tax levy. Again, this movement had its origin in California with the passage of Proposition 13 in June, 1978. Unlike the school reform movement, property tax limitation advocates have used the popular initiative or popular pressure for legislative action rather than the judicial system.[9] Also, unlike the school finance reformers' concern for equity, the tax limitation advocates appear to be only concerned with the level of taxation and government spending. They have, in fact, gone beyond property tax limits to general state and local tax and spending caps.

Each of these reform movements have been on a state-by-state basis rather than by Federal action. However, they portend a national movement. While they appear unrelated, the tax limitation movement will impact on the school reform efforts. Whether the impact will be beneficial or harmful is unclear at this time. Each movement by itself will result in less reliance on the local property tax, but together they suggest a major restructuring of state and local government finance in general, and school finance in particular. A likely result will be a decrease in the local share of school funding and an increasing role for the states. In California, the state's share has risen from 30 per cent to 65 per cent since Proposition 13.[10] Lazlo Ecker-Racz believes that the spending ceiling will have more impact on the ability to achieve meaningful school reform than the property tax limit. Warren Weaver concludes "... that equitable restructuring of public finance systems will continue, certainly as long as state courts insist that the slum child is entitled to an education comparable to his more fortunate suburban counterpart."[11]

Whether the school reform movement can be successful in this period of tax limits and tight budgets depends on the success of shifting from the local property tax to other tax bases such as state sales or income taxes. The continuation of the reform movement also depends in part on the ability to reorganize the multiplicity of school districts. Ecker-Racz asks:

> "Can a centrally-controlled system of vast size and embracing divergent economic, demographic, and cultural societies be reconciled with this country's traditional attachment to community control of school operations?"[12]

Likewise, James Gregg concluded in the case of California that:

> "So long as the state provided less than half the funding for local schools, the myth of local control had substance, at least in terms of revenue sources.
>
> "Yet another irony of Proposition 13's passage is that centralization of power in the state government at the cost of local control is all but inevitable."[13]

It is not known if property tax limitation of even spending caps will reduce support for schools or hinder the drive toward more equality. Much depends on the courts, state support from other sources, and the direction of Federal education support. It is clear that the combined effect will be to reduce the reliance on the property tax for school finance, and to shift education policy making from local control to the state level.

Clearly, the minimum foundation programs will not be sufficient to cope with the combined pressures of demands for school reform and property tax limitations. The Strayer-Haig formulation would not have survived the legal challenges of the Serrano type because "they do not develop solid plans to provide for needs, do not use correct indicators for wealth, and have, in fact, perpetuated inequities in educational opportunities."[14] Other more substantial proposals are full state funding, redistricting and power equalizing.[15] Full state funding and redistricting are means to include a more heterogenous tax base within each school district. The power equalizing proposal "requires a wealthy community to tax itself, say $1.50 for each $1.00 it wants to spend."[16]

Serious doubts about the future of school finance reform are raised by the loss of state surpluses and declining enrollments. Another complicating factor is the continuing difference within the education interest lobby. Some emphasize the need for more across-the-board reduction in wealth-related expenditure disparities. Others seek more funding for special needs of student populations such as the handicapped or central cities. Couple these issues with the tax and spending limits and the slowed pace of court actions, and it becomes obvious the drive for school finance reform will have to become more sophisticated.

Because these are state-by-state reforms, it is necessary to examine state cases. Nevada has developed a minimum foundation program and is in the midst of a property tax reduction and reform which will have substantial impacts upon the school distributive formula. Both the distributive formula and the tax structure will be detailed in subsequent sections. Briefly, the property tax rate for school support will be reduced from $1.50 per $100 of assessed value to 50 cents, and this lost revenue will be contributed from State resources. The remaining 50 cent rate will be subject to a revenue cap goverened by trends in assessed value, inflation and enrollments. The combination of the rate reduction, increased state support and the revenue cap will increase the portion of State funding to total school funding, but will most likely increase wealth-related disparities.
As a result, the examination of data of recent years regarding the operation of the Nevada School Finance Plan will not be an

accurate yardstick for the future. Nevertheless, we have provided this analysis in Sections II and III in order to evaluate the probable effects of the new program, as well as to give the reader a feeling for the objectives of Nevada officials in designing the Nevada Plan. Section IV will be concerned with the effects of property tax reform on school finance.

Nevada Population and Enrollment Trends

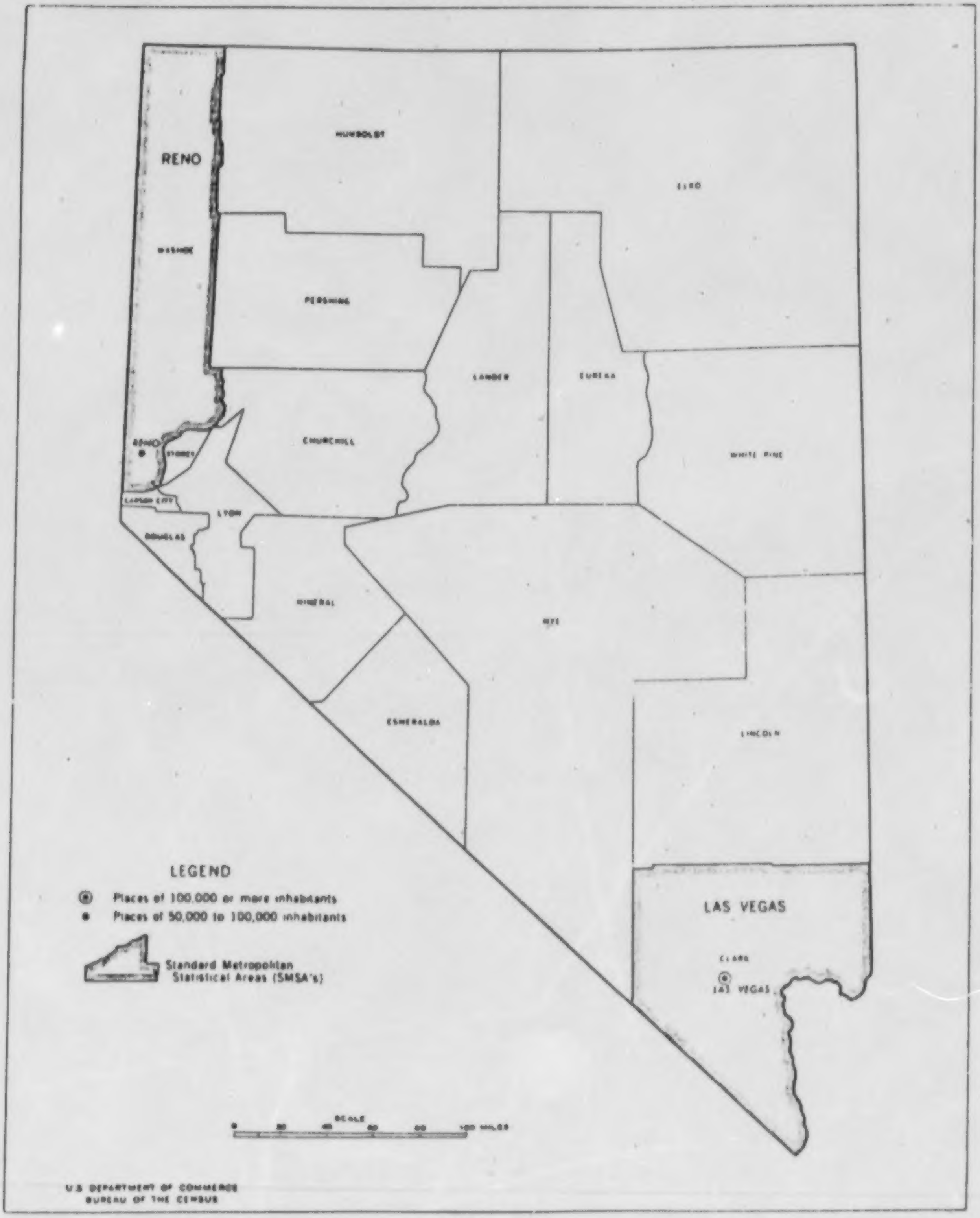
Before turning to these issues we will present some demographic trends and structures affecting the State-local school finance system, and some of the concerns school officials have regarding the Nevada Plan prior to the tax reform.

Nevada, as one of the sunbelt states, is experiencing rapid population growth. The population increased from 285,000 in 1960 to 489,000 in 1970. (See Table 1) It is estimated that the population reached 610,000 by 1976, and is projected to reach 732,000 by 1980. Nevertheless, Nevada still ranks only 47th in total population. Most of the growh is due to net migration rather than natural increase. Between 1960 and 1970 the natural increase was 59,727 compared to the net migration increase of 143,733 new residents.

While the State is experiencing rapid growth it remains one of the most sparsely populated states in the nation. (See Table 2) In 1976, there were 5.5 persons per square mile (110,540 square miles) compared to 60.8 persons per square mile for the United States. However, the statewide density figure is as misleading

Figure 1

COUNTIES, METROPOLITAN AREAS, SELECTED PLACES: NEVADA


RENO
HUMBOLDT
ELKO
WASHOE
PERSHING
LANDER
EUREKA
CHURCHILL
WHITE PINE
RENO
STOREY
CARSON CITY
LYON
DOUGLAS
MINERAL
NYE
ESMERALDA
LINCOLN
LAS VEGAS
CLARK
LAS VEGAS
LEGEND
Places of 100,000 or more inhabitants
Places of 50,000 to 100,000 inhabitants
Standard Metropolitan Statistical Areas (SMSA's)
SCALE
0
20
40
60
80
100 MILES

U.S. DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS

Table 1

POPULATION OF NEVADA COUNTIES:

1920 - 1976

COUNTY	January 1, 1920	April 1, 1930	April 1, 1940	April 1, 1950	April 1, 1960	April 1, 1970	July 1, 1976 [b]
Carson City [a]	2,453	2,221	3,209	4,172	8,063	15,468	26,600
Churchill	4,649	5,075	5,317	6,161	8,452	10,513	11,900
Clark	4,859	8,532	16,414	48,289	127,016	273,288	343,400
Douglas	1,825	1,840	2,056	2,029	3,481	6,882	12,000
Elko	8,083	9,960	10,912	11,654	12,011	13,958	15,500
Esmerelda	2,410	1,077	1,554	614	619	629	800
Eureka	1,350	1,333	1,361	896	767	948	1,200
Humboldt	3,743	3,795	4,743	4,838	5,708	6,375	7,100
Lander	1,484	1,714	1,745	1,850	1,566	2,666	3,100
Lincoln	2,287	3,601	4,130	3,837	2,431	2,557	2,800
Lyon	4,078	3,810	4,076	3,679	6,143	8,221	10,500
Mineral	1,848	1,863	2,342	5,560	6,329	7,051	6,300
Nye	6,504	3,989	3,606	3,101	4,374	5,599	5,900
Pershing	2,803	2,652	2,713	3,103	3,199	2,670	2,800
Storey	1,469	667	1,216	671	568	695	1,100
Washoe	18,627	27,158	32,476	50,205	84,743	121,068	149,000
White Pine	8,935	11,771	12,377	9,424	9,808	10,150	10,000
STATE:	77,407	91,058	110,247	160,083	285,278	488,738	610,000

[a] In 1969, Carson City and Ormsby County became one municipal government - Carson City, an independent city.

[b] Estimate.

Source: U. S. Bureau of the Census, Census of the Population - Nevada: 1920-70, and Bureau of Business and Economic Research, University of Nevada, Reno.

Table 2

POPULATION DENSITY OF NEVADA COUNTIES: 1920 - 1976
(Persons Per Square Mile)

County	Total County[a] Area	1920	1930	1940	1950	1960	1970	1976
Carson City	153	16.0	14.5	20.1	27.3	52.7	101.1	173.9
Churchill	4,913	.9	1.0	1.1	1.3	1.7	2.1	2.4
Clark	8,084	.6	1.1	2.0	6.0	15.7	33.8	42.5
Douglas	751	2.4	2.4	2.7	2.7	4.6	9.2	16.0
Elko	17,181	.5	.6	.6	.7	.7	.8	.9
Esmeralda	3,570	.7	.3	.4	.2	.2	.2	.2
Eureka	4,182	.3	.3	.3	.2	.2	.2	.3
Humboldt	9,704	.4	.4	.5	.5	.6	.7	.7
Lander	5,621	.3	.3	.3	.3	.3	.5	.6
Lincoln	10,650	.2	.3	.4	.4	.2	.2	.3
Lyon	2,024	.2	1.9	2.0	1.8	3.0	4.1	5.2
Mineral	3,837	.5	.5	.6	1.4	1.6	1.8	1.6
Nye	18,064	.4	.2	.2	.2	.2	.3	.3
Pershing	6,031	.5	.4	.4	.5	.5	.4	.5
Storey	262	5.6	2.6	4.6	2.6	2.2	2.7	4.2
Washoe	6,608	2.8	4.1	4.9	7.6	12.8	18.3	22.5
White Pine	8,905	1.0	1.3	1.4	1.1	1.1	1.1	1.1
STATE	110,540	.7	.8	1.0	1.5	2.6	4.4	5.5
UNITED STATES	-	35.6	41.2	44.2	50.7	50.3	57.5	60.8

[a] In Square Miles.

Source: U.S. Bureau of the Census, Census of the Population - Nevada: 1920-1970, and Population Estimates, Series P-26, No. 76-28, and Nevada Department of Taxation.

as the national figure. Carson City had 173.9 persons per square mile in 1976; Clark County (Las Vegas) had 42.5; Washoe County (Reno) had 22.5 persons per square mile. On the other end of the spectrum 8 of the 17 counties had less than one person per square mile. Three other counties had less than three persons per square mile. More than half of the population (56 per cent) resides in Clark County, and another 24 per cent are in Washoe County. This population distribution makes it difficult to provide equal educational services to all areas of the State. The needs and resources of sparsely settled, rural districts are quite different from the two urban centers. Moreover, the eight least settled counties have had very modest population growth, while the urban counties are experiencing very robust growth.

In addition to the rural-urban dichotomy, educators in Nevada are concerned about serving the minority populations. There were 40,561 people classified as minorities in the 1970 census. (See Table 3) This was about 8 per cent of the total population. Of these, 27,762 were Negroes, 7,933 were Indians, and 4,866 were other minorities. While 80 per cent of the population resides in Clark and Washoe Counties, 90 per cent of the Negro population is in these two counties. Indian and other minorities are more evenly distributed throughout the State. The State formula makes special allocations for the physically and mentally handicapped, but it does not explicitly recognize the problem of minority populations.

Table 3

POPULATION OF NEVADA COUNTIES BY RACE, 1970

COUNTY	WHITE	NEGRO	INDIAN	OTHER
Carson City	14,611	166	525	166
Churchill	9,793	135	419	166
Clark	244,538	24,760	1,131	2,859
Douglas	6,649	1	194	38
Elko	12,429	100	1,310	119
Esmeralda	600	1	28	---
Eureka	903	---	44	1
Humboldt	5,735	62	519	24
Lander	2,523	1	138	4
Lincoln	2,488	7	53	9
Lyon	7,688	6	509	18
Mineral	5,933	473	582	63
Nye	5,297	41	227	34
Pershing	2,513	4	126	27
Storey	677	8	9	---
Washoe	115,924	1,987	1,926	1,231
White Pine	9,876	10	193	71
STATE	448,117	27,762	7,933	4,866

Table 4

ENROLLMENT BY GRADES IN NEVADA IN PUBLIC SCHOOLS DURING FIRST MONTH BY SELECTED YEARS: 1950 - 1976

Grade	1950	1955	1960	1965	1970	1973	1976
Kindergarten	1,937	4,116	5,286	8,707	8,359	8,335	9,910
1	3,663	5,791	6,470	10,187	10,317	9,574	10,828
2	3,480	5,477	6,125	9,535	9,954	9,663	9,970
3	3,189	5,775	5,768	9,190	10,300	10,516	9,102
4	2,725	4,518	5,431	8,860	9,566	10,961	9,441
5	2,530	3,994	5,104	8,479	9,819	10,903	9,735
6	2,495	4,142	5,146	8,128	9,482	10,796	10,661
7	2,405	4,116	5,143	7,941	9,426	11,214	11,575
8	2,167	3,793	5,309	7,562	9,364	10,932	11,496
9	2,001	3,280	4,294	7,215	9,587	10,989	11,852
10	1,594	2,904	3,807	6,834	8,060	10,232	11,790
11	1,590	2,445	3,185	6,288	7,163	9,566	10,787
12	1,355	1,968	2,682	5,284	6,556	8,302	9,326
Other, Special Education	17	94	662	1,742	2,502	3,423	5,318
TOTAL:	31,148	52,413	64,412	105,952	120,455	135,406	141,791

Source: Nevada Department of Education, Research Bulletin.

School enrollment growth trends and distributions reflect the general population. Eighty per cent of the total enrollment is in Clark and Washoe counties. (See Table 5) Total enrollment increased from 127,566 students in 1970-71 to 143,781 in 1977-78. Clark and Washoe accounted for 80 per cent of the increase, and another 5 per cent was accounted for by Carson City and Douglas in the Reno-Tahoe region. Six of the 17 school districts experienced an enrollment decline in this period. Only two of these declines were substantial. Mineral County's enrollment declined by 25 per cent due to a reduction in the work force of a military installation, and White Pine's decline was 23 per cent due to labor layoffs at a copper mining facility.

Some Current Issues in Nevada School Finance

Over the years Nevada has developed a minimum foundation program to attempt to equalize expenditures to account for local wealth disparities. Prior to the 1979 tax action only 47 per cent of the local property tax used for school funding was equalized. However, the mandatory Local School Support Tax enacted in 1967, which is a one cent retail sales tax, is within the equalization formula. In 1977-78 the equalized portion of the property tax was $28.1 million and the unequalized portion was $32.1 million. The Local School Support Tax amounted to 43.4 million. Hence, about 69 per cent of the local resources were within the equalization formula. The equalized portion tends to increase over time because the sales tax revenue has increased more in response

Table 5

PUBLIC SCHOOL ENROLLMENT:(a) 1970-71, 1973-74, 1975-76, and 1977-78
(KINDERGARTEN-12 AND SPECIAL EDUCATION)

DISTRICT	1970-71	1973-74	1975-76	1977-78
Carson City	4,338	5,381	5,729	6,062
Churchill	2,898	2,990	2,865	2,813
Clark	73,846	77,862	81,147	84,334
Douglas	1,786	2,438	2,678	3,093
Elko	3,746	4,062	3,948	3,692
Esmeralda	56	97	129	119
Eureka	174	203	255	181
Humboldt	1,723	1,717	1,705	1,670
Lander	747	765	883	872
Lincoln	817	736	803	878
Lyon	2,531	2,617	2,497	2,421
Mineral	1,862	1,752	1,559	1,394
Nye	1,156	1,270	1,429	1,461
Pershing	671	647	701	706
Storey	76	107	141	162
Washoe	28,563	30,374	31,050	31,933
White Pine	2,576	2,388	2,226	1,990
STATE:	127,566	135,406	139,745	143,781

(a)First month enrollment

Source: Nevada Department of Education, Biennial Report.

to inflation than the property tax has. A few other minor revenues, mainly the Motor Vehicle Tax of $5.4 million, are unequalized.

The State funded $84.3 million for schools in 1977-78 compared to $103.6 million from the local property tax and the Local School Support Tax. Thus, the State contributed about 45 per cent of the State-local funds for schools. This proportion has remained in the 40 to 45 per cent range since 1973. It will be less if other minor local revenues are added. Also, about 5 to 6 per cent of school funds have come from the Federal Government in recent years. As we will explain in Section IV, the percentage of State funds will increase significantly with the 1979 tax package, but equalization will likely suffer.

One particular problem Nevada has faced is the attempt to make special allocations to low wealth districts in addition to the minimum foundation program. Assessed value per student is generally regarded as a good indicator of the ability of local tax capacity to support schools. Serious doubts are raised about this indicator from examination of Table 6 and Appendix II. It is difficult to discern a pattern other than the three districts with the smallest enrollments (Esmeralda, Eureka and Storey) had the highest assessed value per student. Curiously, each of these counties had a per capita personal income below the State's average in 1975. Clark County, which is generally regarded as one of the wealthiest districts, had an assessed value/enrollment ratio lower than the State's average. Also, Washoe County, which

Table 6

SCHOOL ENROLLMENT AND ASSESSED VALUE BY DISTRICT: 1977-78

COUNTY	ENROLLMENT	ASSESSED VALUE (000)	ASSESSED VALUE PER PUPIL
Carson City	5,913	119,512	20,212
Churchill	2,743	53,225	19,404
Clark	82,120	1,981,646	24,131
Douglas	2,995	159,365	53,210
Elko	3,567	150,566	42,211
Esmeralda	115	12,785	111,174
Eureka	178	30,268	170,043
Humboldt	1,624	61,613	37,939
Lander	848	30,292	35,722
Lincoln	853	21,769	25,521
Lyon	2,351	73,209	31,140
Mineral	1,361	23,833	17,511
Nye	1,437	79,518	55,336
Pershing	687	36,500	53,130
Storey	158	9,824	62,176
Washoe	31,181	1,096,687	35,172
White Pine	1,944	48,781	25,080
STATE:	140,077	3,989,393	28,480

Source: Nevada Department of Education, _Biennial Report_ and
Nevada Department of Taxation, _Local Government Red Book_

has the highest per capita personal income in the State, and one of the highest in the nation, had an assessed value/enrollment ratio just above the State's average. Obviously, since these two districts account for 80 per cent of the enrollment, they will largely determine the State average. This makes it difficult to construct a formula that will be able to deal with such diverse populations as Esmeralda and Clark. As a consequence, local school superintendents have negotiated the low wealth allocations outside of the formula recently.

In addition to wealth equalization, the formula has evolved to account for needs of small rural districts, large urban schools, special needs of the handicapped and transportation. There is no explicit factor in the formula to address the problems of minorities and their cultural differences. While blacks are concentrated in the urban centers, particularly in Las Vegas, Indians are represented in most districts. There is a wide-spread feeling among education officials that the formula has been stretched to the limit, and needs to be thoroughly re-examined. The State Department of Education made a request to the 1979 session of the Legislature to fund a comprehensive study of the formula, but the proposal was denied. Given the diversity of the State's population, the formula will continue to evolve. The tax reform of 1979 will give this further impetus.

Finally, our analysis has been limited to inter-district equalization. Since Nevada has 17 county-wide school districts, it is possible that intra-district disparities might occur which our study does not recognize.

II

A HISTORY OF THE STATE'S ROLE IN SCHOOL FINANCE IN NEVADA

The issue of which level of government should be responsible for education policy and finance has been an important topic throughout the history of the State. To properly understand the current debate on school finance reform it is imperative that the evolution of laws relating to the financing of education be considered. As early as 1884 the State Superintendent of Public Instruction made the following lament.

> "Why is it that some of Nevada's offspring, with a scanty three months in school, must struggle to obtain from a cheaply paid teacher the elements of a primary education, while others can, for ten months annually, under the tuition of normal school and college graduates, enjoy the privileges of the grammar school and the high school?... Is there any rational explanation of the fact that while Storey County has an average of ten months of school, White Pine County has an average of four and one-half months?... Have we a state system at all or it is not rather a county or district system?"[12]

Financing of public education has historically been developed along the line of dividing the cost among all levels of government, including the State, the county and the school district.[18] Yet in the early days there was little State direction in educational policy and little State support. The role of the State Superintendent was increased in The Reorganization Act of 1907. Among other provisions that Act made the Superintendent responsible for apportioning State aid to the districts.

> "Whatever money the State has given to the schools has always been allocated on the basis of an apportionment formula.... The actual amount of per-pupil and per-teacher apportionments which the State has given has varied considerably over the years, and the method for computing these apportionments has changed from time to time, but the basic system by which State support is distributed to the individual schools remains largely unchanged from the time of its creation."[19]

This system began to break down in the face of a critical shortage of teachers during World War II. A coalition of the Nevada State Education Association, the Nevada Taxpayers Association and the Nevada Legislative Counsel Bureau was formed in 1946 to deal with this crisis. They submitted their report addressing financial and organizational problems of the school system in 1948. However, the State Legislature dealt with many of their concerns in the 1947 session, and made substantial changes in school finance and organization. For our purposes the Legislature made two important changes in 1947. First, State aid to rural schools was increased. This was a recognition that small, low wealth districts did not have a sufficient tax base to support themselves even with normal State aid. Second, it provided State aid to high school districts for the first time.

The Nevada School Finance Study Group of 1946-48 supported more far-reaching proposals than those enacted by the Legislature. They were concerned about the declining level of State aid, the excessive number of school districts and the inadequate budgeting staff of the State Superintendent. In 1937, the State provided 23 per cent of school funds; the county 66 per cent; and the district 11 per cent. By 1947, the State supplied only 18 per cent; the county 54 per cent; and the district 28 per cent.[20] The county which offered the most support had the least voice in education policy. During the school year of 1946-47 there were 197 elementary schools and 41 high schools in Nevada. Of the elementary school districts only 143 levied a district tax for their own support. The School Finance Study Group concluded that only 22 of the elementary districts were "large enough to operate efficiently."[21]

The Study Group cited four principles to support their recommendation.[22] (1) The principle of State responsibility. The principle is generally accepted that the State as a whole is responsible for education. They concluded that little attempt was made to arrive at a minimum education. "Legal provision for State supervision of school budgeting, accounting, or a fiscal policy does not for all practical purposes exist."[23] (2) The efficiency principle. This principle states that the State shall make provision for local initiative, and that school districts be large enough for the operation of a school system and for the provision of local leadership. However, local initiative does not have for an end merely local needs, but the broader requirements of citizenship as well. (3) The equalization principle. This principle calls for a minimum program supported by the State with districts contributing according to ability to pay. The State must supervise the minimum program, but districts can exceed the minimum through local effort. The Study Group concluded that "the allocation of State money on a teacher-pupil apportionment formula has not promoted equalization."[24] (4) The Prudential principle involves the right of the State to insist upon the honest and efficient handling of money.

These findings and principles provide a good benchmark to discuss more recent reforms in Nevada.

The Peabody Plan, 1955-67.

The financial problems of Nevada schools continued despite the 1947 reforms. The Governor found it necessary to appoint a State School Committee of prominent Nevada citizens in 1953. The Committee's charge was to:

> "First investigate the financial conditions of schools throughout the state and, upon the basis of such investigation, recommend as to whether a special session of the Legislature was necessary; second, to carry on a survey of school conditions during 1954 and report the results of the survey at the 1955 session of the Legislature."[25]

The Committee did recommend a special session of the Legislature for 1954. That special session authorized a fact-finding committee of citizens and appropriated $30,000 to carry out the survey. The Governor's School Committee assigned the primary responsibility to the George Peabody College for Teachers of Nashville, Tennessee. The Peabody Report was adopted by the Governor's Committee. It called for a major increase ($4 million) in State funding to provide for a basic foundation plan.

Nevada had neither a general sales tax nor an income tax. In order to provide the funding for the basic foundation plan recommended by the Peabody Report the 1955 session of the Legislature authorized a referendum vote on a 2 cent sales tax. Voters thought the sales tax revenues were earmarked for education and approved the tax measure. They were disillusioned to find it was not earmarked for education, and rejected later attempts to increase the sales tax to 3 cents.

Basically, the Peabody formula for financing education, as passed in 1955, was as follows: State minimum requirements would be calculated by multiplying the average daily attendance of pupils in grades 1 through 12 by $80, kindergarten pupils in average daily attendance by $40, the number of certified teachers employed by $4,000, and adding the results. From this figure a 70 cent tax on the county's assessed valuation would be subtracted. The remainder would constitute the state's contribution. Changes in the per-pupil and per-teacher allotments from 1955 to 1966 greatly increased the state appropriation.

In the school year 1966-67, the last year of state distribution of school funds under the Peabody formula, the law provided that the state minimum requirements should consist of the sum of the following: the number of elementary and secondary school pupils in average daily attendance multiplied by $100, the number of kindergarten pupils in average daily attendance multiplied by $50, the number of handicapped pupils in average daily attendance multiplied by $500, the number of teacher entitlements multiplied by $5,100, and one-half the cost of transportation.

The other major result of the Peabody Report was the consolidation of school districts. After 92 years of local districts, when as many as six kinds of districts were recognized by law and allowed to organize with five resident children and to exist with three, seventeen county-wide school districts were created.[26] Each county district is administered by an elected board of trustees and a district superintendent appointed by the board. The county school districts were made directly responsible to the State Department of Education which over time has made them more accountable to the State. Presently, the districts' financial accounting and budgeting format is prescribed by the State Department.

The Peabody formula did offer more generous support for a basic foundation program for each district. However, the sales tax was not earmarked for education. Moreover, each district could supplement its basic program with up to an 80 cent additional levy above the 70 cent levy provided in the basic plan. Most districts have used the full $1.50 tax capacity, which means wealthy districts can support each student more generously than poor districts. The consolidation did bring about a more efficient system and probably a greater degree of inter-district equality. Less is known about the effect on intra-district efficiency and equalization, however. More will be said about this in Section III.

The Nevada Plan: 1967-79.

Even after the enactment of the two cent sales tax in 1955, there was a continuing need to call a special session of the Legislature in even-numbered years to deal with school finance. Education was still dependent on the Local property tax to a large extent. Efforts to increase the sales tax to three cents in the early 1960's were defeated. Since the original tax was passed by referendum, any subsequent amendments must be submitted to the people.

The State experienced very rapid population growth in the post-World War II period with few broad based taxes. Gaming taxes were increasing for the State general fund, but there was no personal or corporate income tax, estate or inheritance tax, and a very modest sales tax. Nevada was becoming more urbanized with centers in Las Vegas and Reno. Carson City and the Tahoe region in northwestern Nevada also grew rapidly. Eastern and central Nevada still suffered from sparse populations and the boom-bust cycle of mining camps.

State Senator Carl Dodge of Fallon began to work for a remedy to the continuing school finance problems. He devised a plan whereby an additional, separate sales tax could be adopted without going to a vote of the people.[27] He proposed a one cent Local School Support Tax to be levied on the same base as the two cent tax. The one cent tax would be returned to the county of origin and earmarked for use by the school district. The Legislature approved this tax in 1967. Since it was not submitted to the people, a quick Court Challenge was sought. The Nevada Supreme Court ruled that the new tax was a separate tax and upheld the Legislature's action.

The enactment of the Local School Support Tax led to the substitution of the "Nevada Plan" for the Peabody formula. It was the intent of the Legislature "that the proper objectives of State financial aid to public education is to insure each Nevada child a reasonably equal educational opportunity."[28] The Nevada Plan as amended attempts to achieve this objective by a formula which recognizes need on a per pupil basis and a program basis. State financial aid equals school district basic support guarantee minus local available funds produced by mandatory local taxes. Local revenues are the 70 cent mandatory tax on each $100 of assessed value and Local School Support Tax Revenues. If the Local School Support Tax is considered a local tax the State support as a percentage of total school revenues declined. This is the proper interpretation since revenues are returned to the district of origin and calculated as part of the local effort since it is a mandatory tax. However, where collections are low the State will offset the deficit. While the tax increased funds earmarked for schools, it did not, in itself, reduce inter-district inequality.

For each biennium the Legislature establishes the total basic support guarantees per pupil and subtracts the estimated local mandatory revenues to arrive at the need for State support. The local mandatory revenues for 1977-78 were $28.1 million from the 70 cent per $100 assessed value property tax and $43.4 million from the Local School Support Tax.

The State allows each district to raise revenues outside of basic support. These include an optional 80 cent property tax levy, a motor vehicle tax and P.L. 874 revenues for Federal installations. These revenues are the cause of the remaining inequality in school funding. In 1977-78, the 80 cent property tax generated $32.1 million compared to $5.4 million in motor vehicle taxes and $5.1 million in P.L. 874 revenues. Obviously, the major cause of the difference in support per pupil is the optional 80 cent tax on each $100 of assessed value.

The Nevada Plan attempts to satisfy three objectives. First, a State system of public education. Second, a reasonably equal education opportunity. Third, education as a social right of each child in a manner which cannot be a function of the wealth of his parents or neighbors.

Recognition is given to existing variations in costs by using the following:*

a. Elementary pupil costs weighted 1.0.

   This represents the largest population; therefore, a convenient base of reference.

b. Kindergarten pupil costs weighted 0.6.

   Here, the daily schedule is shorter and more pupils can be served by facilities.

c. Secondary pupil costs weighted 1.4.

   The daily schedule is longer; course offerings are greater; and more facilities are required.

d. Value of teacher and other certified employee (other than teachers of graded and subject classes) allotment is uniform.

e. Allotments for teachers are made for different counts of pupils within geographical areas.

Where population is sparse, few pupils are available for placement in a graded or subject class.

Where population is larger, pupils are available for placement in graded or subject classes of more efficient size.

f. Allotments for other certified employees are made for different counts of teacher allotments within school districts.

Where population is dense, concentrations of pupils with special educational needs, and complexity of intra-district communications, management and control require more supervisory, technical and professional staff.

g. Support is provided for transportation services at the legislatively approved level of 75% of costs. Increased to 85% in 1979-81 biennium.

*Source: Nevada Department of Education

In addition, since 1973, allotments are made for special education units for handicapped or gifted students on a formula basis. Recently, support for additional apportionments to provide fiscal neutrality in low wealth districts has been added to the formula. The reasoning for this additional factor in the formula as given in the Nevada Plan is the following:

> "Additional apportionments per pupil for low wealth are provided in basic support for a district whose resources outside basic support are less than the weighted average available resources outside basic support for all districts.
>
> "The effect of this additional apportionment for low wealth is that each district will have total resources per pupil of at least 80 per cent of what they would be if all resources, statewide, were apportioned as Equalized Basic Support is apportioned."[29]

Many people involved in education in Nevada have recognized this means for providing additional resources for low wealth districts has not worked as intended. If the basic formula actually equalized expenditures on the basis of wealth as a measure of fiscal capacity, there would be no need for an additional low wealth factor. If more of the property tax were included in the basic formula, the need for a special low wealth factor might be reduced. Also, P.L. 874 funds could be considered as local mandatory revenues in lieu of property taxes. As we explained in Section I, high wealth districts tend to be districts with low enrollments and small classes. In 1979-80, there are five districts targeted to receive a low wealth allocation.

Carson City	-	$ 30 per student
Churchill	-	43 per student
Lander	-	35 per student
Lincoln	-	98 per student
Mineral		100 per student

There is no obvious common characteristic shared by these five districts other than they are neither the largest nor the smallest. We also will point out in Section III that there is a negative correlation between per capita income and per student wealth. In recent years the low wealth allocation has been made by negotiation among the district superintendents rather than by formula. This will be illustrated by an actual example in Section III.

The Nevada Plan includes three program elements in addition to the equalized basic support calculated on a per pupil basis.

The three program elements are (1) transportation, (2) special education, and (3) low wealth. Transportation expenditures for equipment and operating are supported by the State at a 75 per cent level. This has been increased to 85 per cent for the 1979-81 biennium. This increase in reimbursement considers the extreme costs of pupil transportation in the smaller and sparsely settled districts of Esmeralda, Eureka, Lander, Lincoln, Nye and Pershing. The reimbursement is based on the experience of capital acquisition and operating expenses of the previous biennium. Thus, there is always a lag between the actual expenses and the disbursements which can cause some distress for small districts in periods of inflation. Special education units are allocated to provide instructional services for pupils who are unable to make satisfactory progress in regular graded programs of instruction. These units are apportioned on the basis of teacher allocation. In recent years one special education unit is provided for each 9 regular teacher allocations except every district gets at least two units. Low wealth was discussed above. Each of these program elements are included as factors within the formula.

The major part of the Nevada Plan formula is the equalized basic support factor. The Plan recognizes that where pupil population is sparse, group service units must be maintained for small numbers ofpupils, while in more densely populated areas, group service units can be maintained more efficiently by serving larger numbers of pupils in a group. Data generated by the State Department of Education show that not less than 80 per cent of school expenses are for establishment and maintenance of classroom and service units that serve groups of pupils, while not more than 20 per cent of expenses are for serving pupils one at a time.[30]

In recognition of the cost for providing regular instruction for sparsely populated areas, the pupil/teacher ratio is lowest for small schools. Curiously, it peaks at middle size attendance areas (4,800 for elementary pupils and 3,200 for secondary pupils) and declines for the largest schools. For example, an elementary attendance area of 3 pupils will have one teacher, an area of 192 pupils will have a ratio of 26 to 1, and an area of 14,401 will have 24 pupils per teacher. (See Appendix IV)

In addition, large districts are allocated more non-teaching certified staff allocation per teacher than small districts: Less than 600 enrollment, one for every 5 teacher allocations; 600-120 enrollment, one for every 4 teacher allocation; more than 1,200, one for every 3 teacher allocations.

The rationale for more generous allocations of other certified employees is that large districts are more complex and more difficult to manage.

The Nevada Plan has evolved since 1967 in an attempt to meet the diverse needs of Nevada society. It recognizes the difference between the costs of kindergarten, elementary and high school levels. The needs of sparsely settled rural districts and the demands placed on urban districts are addressed. Dollar for dollar equalization is not the goal, but instead special support is aimed at low wealth districts. Transportation and special education receives specific attention in the formula. Along with the earlier consolidation of districts, the Nevada Plan has made reasonable progress toward the goal of providing a basic statewide system where education is not a function of the wealth of the parents. However, problems remain.

The State makes no direct provision for educational handicaps associated with racial and cultural differences in the student population. Certain areas of the State have considerable concentrations of Blacks and Indians with inadequate family educational backgrounds who need compensatory programs. Also, there is a growing Spanish speaking population in several communities who will need bilingual education.

The so-called urban factor of awarding additional teacher allotments to large schools compared to medium-sized schools needs explicit justification in the plan. (See Appendix IV) Small schools get an extra allotment because of an assumption of economies of scale. An extra allotment of non-teaching classified employees is given to large schools because of the complications in managing a large system. There is no justification given in the Nevada Plan for the extra allotment of teachers to large schools. Some people we have talked with suggested that one of the objectives of the urban factor was to provide extra resources to inner-city schools with large minority populations. If that is the case then it should be clearly stated in the Plan so the provision could be evaluated for its effectiveness.

The State needs to reconsider its provision for allowing 53 per cent of its local school property tax revenues to remain outside the equalization formula. The enactment of the 1979 tax package was an opportune time to undertake this reconsideration, but it was not done. In fact, as we will show in Section IV, the level of equalization will decline with the new plan.

The Legislature appropriates money for the School Distributive Fund each biennium. The budget method used typically leads to larger appropriations than disbursements because revenues are underestimated. For instance, in the biennium of 1977-78 and 1978-79, there was $154.6 million appropriated to the school fund, but because earmarked State revenues and mandatory local revenues increased more than anticipated, $27 million remained unspent at the close of the biennium, and reverted to the general fund. $22 million was due to higher than forecast local revenues, mainly the Local School Support Tax, and $5 million was due to more rapid growth of State revenues earmarked for the school fund. The $27 million balance amounts to 17 per cent of the appropriations, and was a substantial contributor to a hefty surplus. Many observers felt that the surplus was a factor in the positive popular vote on property tax reductions. Obviously, better revenue forecasts are needed. The Legislature is decidedly more conservative in forecasting revenues in the second year of the biennium. The education lobby has won a trigger mechanism to add more than the budgeted funds to the school distributive fund in the second year if State revenues exceed the forecast.

After this brief discussion of the evolution of the State's role in school finance in Nevada, and an introduction to the Nevada Plan, we turn to a more detailed examination and evaluation of the Nevada Plan in Section III. In Section IV we discuss the effects of the 1979 tax reform on the Nevada Plan.

III

AN EVALUATION OF THE "NEVADA PLAN" 1967-1969

Nevada uses a variant of the Strayer-Haig foundation program to finance its public education. It is the most commonly used scheme and Nevada's plan has defects which are similar to those in other states: Inflexibility, inequitable allocations of funds, cleavages between the sources and beneficiaries of funds, etc.[31] The basic structure of the program is as follows: The state legislature sets a required level of expenditure per pupil (the foundation) and a minimum required taxation rate, which each district must impose (usually on property). The difference between the foundation support figure and what revenues the district can raise is the state's contribution. In the current Nevada foundation program, called the "Nevada Plan", the foundation support level varies by district according to a rather complex formula.

The Formula

The mechanics of the plan appear complex, involving as they do both considerations of needs as well as equalization of educational opportunity across districts. The crucial figure is the average state guaranteed basic support per student. This figure is arrived at through negotiations between the State Department of Education and the Legislature. Using population projections for the state, and some cohort models, the State Department of Education estimates needs.

This estimate could become quite complex, involving as it does all 17 districts lumped together. In practice a simple percentage increase over the preceeding biennium is negotiated between the State Department of Education and the Legislature. Actually, two figures are projected, one for each of the two coming school years. The percentages reflect the relative importance which the Nevada Legislature places on education relative to other expenditures. As we shall see in Part Three of this section, education receives a relatively low priority.

We chose FY 1977-78, the second year of the 1976-78 biennium as an example of how the basic support guarantee is translated into allocations to the 17 districts. The worksheet used to calculate the allocations appears as Appendix III. The Legislature voted $1,034.84 per pupil as its basic support guarantee for that year. But no single district got exactly that figure per pupil. Instead, the basic support guarantee varied from a minimum of $1,007 in wealthy Washoe County to a maximum of $1,954 in sparsely settled Esmeralda County. The average of the support guarantees for all the counties was exactly $1,034.84.

Generating the different basic support guarantees for each county/district is a bit complex, but is for the most part mechanical. Essential to the formula are the teacher allotments, which are based on student enrollments. On the last day of the first school month of the school year, official attendance is taken. A different sum of money is allocated per pupil for kindergarten, elementary and secondary. Each district received $136 per elementary pupil and $190 per secondary pupil. (Kindergarten students were treated at 0.6 of an elementary student.) For each special education unit (teacher plus his/her students) the district received $17,600.

Somewhat less straightforward is the teacher allotment formula. The assumption seemed to be that the student/teacher ratio should be lower in very small and in very large enrollment districts. As an example of this U-shaped cost function, the following is the table of teacher allotments for secondary students:

Teacher Units for Secondary Pupils*

Enrollment From	Enrollment To	Number of Teachers	Pupil/Teacher Extremes	
Not more than	45	5	---	9
46	54	6	7.6	9
55	77	7	7.9	11
78	104	8	9.8	13
105	135	9	11.7	15
136	170	10	13.6	17
171	209	11	15.5	19
210	252	12	17.5	21
253	3,200	divide by 22, but not less than 12	22	
3,201 of more		divide by 21	21	

*Source: Nevada Plan for Support of Public Education, January, 1979

The low pupil-teacher ratio in small enrollment areas is called the "rural factor"; the "urban factor" is reflected in the drop in pupil-teacher ratios at the high end.

Supervisory personnel and other staff positions are allocated on a 1-5, 1-4, or 1-3 teachers as the districts increase in size. Special education units in 1979-80 consisted of one unit per every 9 normal teacher allocations. (See Appendix IV)

It should be mentioned that it is advantageous for a superintendent to define enrollment areas within his district to maximize his teacher allocations. Subdividing the district into more, smaller enrollment areas takes advantage of the "rural factor" and will lower the overall pupil/teacher ratio in the district. This means a bigger support guarantee for the district. It has been alleged that this type of manipulation has occasionally been tried, though solid justifications for the particular divisions in question have always been forthcoming from superintendents.

Using FY 1977-78 data for Washoe County we can easily show how the basic support guarantee for that county was calculated.

Enrollment (all grades)	31,180.6
Total Teacher and other Certified Personnel	1,814*
Teachers + Personnel x $11,900 =	$21,586,600
Elementary Enrollment x $136 =	2,137,729
Secondary Enrollment x $190 =	2,937,780
Total Support Value	$26,662,109

$$\text{Support Value Per Pupil} = \frac{\$26,662,109}{31,180.6} = \$855$$

*From Appendix IV

This $855 for Washoe County is compared with the lowest from all the districts, which happens to be $820 in Pershing County. Washoe is given the value $\frac{855}{820} = 1.0426$, or 4.26% above the lowest. The relative percentages for all 17 districts are averaged and a "discount" factor applied to those below average. Washoe ends up with a discount factor of .9861 which is its 1.0426 divided by the state average of 1.058.

The "discount factor" now largely determines what portion of state funds Washoe gets. The .9861 is applied to the basic support figure $1,034.84 to give Washoe County's basic support figure of $1,020.46. Added to this are transportation per pupil funds based on 85% of the expenditures from the previous two years. Thus, it appears that Washoe's basic support guarantee should be above $1,050 per pupil because transportation amounted to around $30/pupil.

One consideration that has so far been left out is the "low wealth" factor, which arises from the frank recognition that some counties with particularly low wealth simply cannot support their schools with the allocations mechanically generated by this plan. So in a process of multilateral bargaining among superintendents and the State Department of Education, 3 to 5 counties have received extra funds at the expense of the wealthiest counties, such as Washoe County (Reno) and Clark County (Las Vegas). Thus, Washoe County ended up with an official basic support guarantee of only $1,007 in FY 1977-78.

A figure of basic guaranteed support per pupil for each district is recommended to the Legislature by the State Department of Education and they may adjust the entire scale up or down, but the relative sizes of district allocations are traditionally not matters of legislative concern. Since the allocation of monies among counties is a primary function of legislatures, this non-intervention in the administrative allocation strikes some people as strange.

Once the basic support guarantee is passed everything else is simply arithmetic.

Number of Students in Washoe County	31,180.6
Basic Support Guarantee	x $1,007
Guaranteed Basic Support	$31,398,864

Plus

Special Education Units	$ 17,600
	x 132
	2,323,200

Total Guaranteed Basic Support = $33,722,064

Local taxes picked up 59.2% of the basic support guarantee that year in Washoe County. Those mandatory sources are the following:

70¢ Property Tax

Assessed Property Valuation	$1,096,868,945
	x .007
	$ 7,678,083

Plus

1¢ Sales Tax	$ 12,286,839
Total Local Funds Available	$ 19,964,922
Total Guaranteed Basic Support	$ 33,722,064
Locally Generated Revenues	$ 19,964,922
Due from State Distributive Fund to Washoe County	$ 13,757,142

One pecularity of the Nevada Plan is that property assessments always lag behind actual values. Since expected property revenues are always lower than actual collections, the state educational distributive fund typically overpays districts where property values are rising rapidly. This has been the case in Washoe County, where estimated state funds distributed were $13,825,000, which amounted to $67,878 above what they should have been ex post. This $67,878 went back into state general revenue funds. While this systematic reversion of monies from education to general revenues is certainly not ideal, it is much better than the chronic shortage of funds suffered by most districts in the second year of the biennium under the old Peabody Plan prior to 1967.

Total funding per pupil in Washoe County greatly exceeded the official $1,007 in FY 1977-78 because considerable revenues were generated by the optional 80 cent property tax and from other, less significant sources. Counties like Washoe with large property assessments can give their students a richer educational experience than poorer counties like Mineral County. So although the state distributive fund goes some distance in equalizing educational opportunity among districts, the existing inequalities in wealth guarantee that a large degree of inequality remains.

Nevada has a gap between the rhetoric of equal opportunity and the reality of unequal funding among districts and within districts. Districts with more taxable wealth are able to spend more per student. In 1977, wealth per student varied from $170,043 in Eureka County to only $19,404 in Churchill County.[32] Yet, as we will see later, relative income per capita, which is probably a better indicator of taxable capacity, was reversed, In Churchill income per capita was $6,057 per year, and in Eureka, only $4,784. To compound the difficulties, the state aid figures to various districts-counties jump around from year to year with little apparent connection to a formula.

The formula that is used in all such limited equalization foundation programs is based on two concepts.

1. Need of the district - which is always related to enrollment and sometimes to special needs such as transportation (true in Nevada).

2. Funds are allocated in inverse proportion to local tax capacity.

This second, redistributional aspect of the scheme has two parts. Five districts are presently designated low wealth and get from $30 to $100 extra state allocation per pupil.[33] According to the Legislature, leveling takes place in this operation because no district is "leveled down" in order to "level these low wealth districts up." It is not likely that the entire educational budget has been increased by the amount of the low wealth allowance. In fact, we know from calculations made above that wealthy districts did give up funds.

Redistribution also takes place in another, more common way. Some districts are able to raise more tax revenues from their mandatory 70 cent property tax and 1 cent sales tax than other districts. Since the state fills in the gap between the foundation basic guarantee and the per pupil amount raised by the district, the state distributive fund payments will vary inversely with the district's tax capacity. Wealthy districts get less from the state, poor districts get more.

But lest one become too impressed with the equalizing tendency of the Nevada Plan, it should be pointed out that wealthy districts naturally spend far more per pupil despite all the mechanisms for redistribution. We will elaborate how this inequality arises for local wealth taxes, discuss some curious aspects of the needs formula and discuss alternative, more appropriate measures of tax capacity. But first, to set the stage for our analysis, we examine the relative poverty of public education in Nevada relative to the other states.

Trends in Support for Public Education in Nevada

By commonly accepted measures, Nevada has a larger gap than any other state between its ability to raise tax revenues from its own sources (tax capacity) and its utilization of this ability to produce revenues (tax effort).[34] Despite a high per capita income (4th rank in 1977), Nevada ranked only 27th in expenditure per pupil in elementary and secondary schools. Prior to the much heralded Nevada Plan, in 1960 Nevada was 9th in the nation in expenditures per pupil. Education seems to have a low priority in Nevada, for education expenditures have consistently been a smaller per cent of total government spending since 1960 in Nevada than in 45 other states. Pupil-teacher ratios were higher in Nevada than any other state in 1976; the ratio fell from 23.6 (1960) to 31.3 (1976), a drop from 26th to 50th place among the states.

Some well-known studies have purported to show that expenditure per pupil and class size have little measurable effect on educational achievement.[35] Yet, other studies demonstrate the obvious fact that class size and the quality of the teacher are the principal variables which can be manipulated to produce successful educational outcomes. It is interesting that the Nevada Needs Assessment cognitive tests of 3rd, 5th and 7th grades done in 1973-74, showed Nevada pupils dropping below national norms as they progressed through the public schools.[36] Third graders exceeded national norms in all 5 subject areas, fifth graders equaled or exceeded national norms in only 3 areas (they scored poorly in arithmetic concepts and applications), and seventh graders fell below national norms in all areas. Indians, Blacks and Spanish-Americans already had difficulties in third grade and were totally below the norms by fifth grade.

Achieving equality of educational opportunity would seem to mandate higher educational expenditures for all students to that they can compete for admission to universities outside the state or successfully compete for jobs. But especial attention needs to be paid to minorities since their experience in schools has been particularly disappointing. Except for Federal monies in the case of Indians, no special budgetary provisions are made for minority students in the Nevada Plan.

The state portion of overall public school financing has followed no constant trend since 1950. There is no steady rise in the centralization of school finance such as that observed in many other states. There was a rise in the proportion of state funding in 1956 with the introduction of the so-called Peabody Plan and then a sharp drop around 1966-67 as the present Nevada Plan was being implemented. (See Table 8) The total state contribution was down to only 32.3%, with local sources accounting for 60.4% in 1977-78. The share of the Federal contribution has fluctuated around 6% since 1950.

The State will certainly be assuming a larger share of the total if Proposition 6 (Nevada's Proposition 13) passes, cutting local property taxes. Also, we will demonstrate in Section IV that the Nevada Plan falls far short of providing equal expenditure per pupil and cases similar to the Serrano case could be brought in Nevada by parents in poor districts or in poor sections of any district.

"Need" in the Nevada Plan

Since 1956 there have been 17 school districts in Nevada, each coterminous with one of the 17 counties. Each biennium the State Department of Education uses a formula to calculate how many dollars per student each county/district is to receive. This supposedly objective determination is ostensibly based on

Table 8

STATE DISTRIBUTIVE FUNDS AS A PROPORTION OF TOTAL FINANCING

SCHOOL YEAR	STATE	DISTRICT	FEDERAL
1950-51	.35	.59	.06
1951-52	.33	.54	.13
1952-53	.34	.58	.08
1953-54	.42	.50	.07
1954-55	.46	.48	.06
1955-56	.50	.44	.06
1956-57	.53	.42	.05
1957-58	.52	.43	.05
1958-59	.53	.44	.03
1959-60	.57	.35	.08
1960-61	.57	.38	.06
1961-62	.58	.35	.06
1962-63	.59	.35	.06
1963-64*	---	---	---
1964-65	.55	.40	.06
1965-66*	---	---	---
1966-67	.33	.62	.05
1967-68	.35	.58	.07
1968-69	.30	.64	.06
1969-70	.32	.61	.07
1970-71	.32	.61	.07
1971-72	.33	.61	.06
1972-73	.29	.66	.05
1973-74	.35	.60	.05
1974-75	.32	.62	.06
1975-76	.35	.59	.06
1976-77	.32	.62	.06
1977-78	.32	.60	.07

NOTE: Rows do not sum to exactly 1.0 because of rounding

*Data not available

Source: Nevada Department of Education Biennial Report need. The calculations are full of assumptions which seem to represent the results of political bargaining between the superintendents and the State Department of Education. The Legislature seems unwilling to question the relative sizes of the support figures, though these would seem to be of considerable political interest. Instead the Legislature confines itself to defining a statewide average number of dollars per student to be allocated as basic support.

We have already mentioned that the formula leaves considerable room for "horsetrading" between superintendents and the State Department of Education.

Item-The pupil/teacher ratio is dependent on how the district is divided up into attendance areas.

Item-The "low wealth" factor allocations were totally politically negotiated and demonstrated how antiquated the plan was. Some superintendents have suggested that the plan has demonstrably outlived its usefulness.

Finally, it is inevitable that actual costs in a district will not be reliably estimated by any formula. For example, a district is allowed $11,900 per teacher. Since 1969, teachers in Nevada have bargained collectively for salaries; some teachers' associations, e.g., Clark County, are stronger than others. The absence of non-uniform and changing salary scales across the state make the Nevada Plan formula too inflexible to be applied without constant adjustments. It is generally known that such adjustments have taken place. The question is, what is the proper forum for bargaining over state distributive education funds?

Some modern political scientists believe that behind-the-scenes negotiation of interested parties is the most efficient way to allocate public monies.[37] All the interested parties (superintendents) are involved and they presumably represent the interests of those in their school districts. Their bargaining may achieve the most efficient and equitable distribution of funds with no expenditure of valuable time of legislators.

An opposing view has it that negotiations involving dispersal of public monies should be done in full public view in the Legislature by the elected representatives of the people. Spending tax revenues is one of the chief functions of representative government. To routinely delegate responsibility for distributing over 34% of the state budget (1978) to 17 superintendents and a few unelected officials in the State Department of Education seems inconsistent with an open democracy.

"Equalization" in the Nevada Plan

A. Among Districts

It is hardly a radical proposition that each child deserves equal opportunity in education. Different school districts have different tax bases and when the only source of school finance is local, schools will necessarily have disparate per pupil expenditures (Serrano). The remedy is for state funds to be used to equalize the expenditure per pupil so that each child's education is not dependent on the wealth of his or her district.

Some people would go further in arguing that equality of the outcome of schooling is what is important in the job market. Children with learning difficulties from disadvantaged homes must have more money spent on them so that they finish the schooling process with abilities equal to their peers from more fortunate circumstances. The job market in Nevada is demonstrably biased; biased schooling simply compounds the obvious inequality in Nevada and elsewhere in the United States.

Correlations run on pooled data for 1973-74 to 1977-78 on the 17 counties/districts (85 observations) show that the wealth per student is highly correlated with total expenditure per pupil: The correlation coefficient is +.86. Counties with high taxable wealth use that large tax base to supplement the basic support guarantee. This is the optional 80 cent property tax which all but three counties add to the mandatory 70 cent tax.[38] Counties with high wealth spend more per pupil, creating a source of inequality among counties. State distributive funds do not offset these inequalities according to our data. The correlation coefficient between wealth per student and expenditures from the state distributive fund is not significantly different from zero. However, the state distributive fund expenditures are naturally correlated with the total expenditures per pupil of which they are a part.

It has been often suggested that income is a better measure of fiscal capacity than wealth.[39] Property rich but low income areas occur in rural counties (such as Esmeralda) as well as in central cities. In fact, our data show a negative correlation between per capita income and per student wealth of -.20. When we consider the distribution of State funds relative to per capita income, we find a correlation of -.38; this is more in line with our a priori notions of distributive justice. How this pattern appeared, given the fact that per pupil wealth rather than per capita income was one of the implicit distribution criteria is not at all clear. The choice of income vs. wealth as a redistributive criterion in Nevada deserves much more study.

B. Within Districts

Real equality of opportunity involves each individual child, not just an equalization among districts. Children's experiences vary greatly within schools in a county-wide school district. Although we did not have the appropriate data, many Washoe County teachers will admit that elementary schools in the affluent southwestern part of Reno are superior to those in the northeast where per capita income is lower. This is an area which warrants much more research. The main difficulty is finding a reliable source of data. The State is satisfied to monitor inter-district equality in order to protect the Distributive School Fund.

IV

PROPERTY TAX REFORM AND SCHOOL FINANCE IN NEVADA

Nevada is in the midst of a tax reduction movement similar to the Jarvis-Gann iniative in California. In fact, in November, 1978, Nevada voters approved Question 6, which is nearly identical to California's Proposition 13. However, unlike California, the process to revise the State Constitution by iniative in Nevada requires two consecutive affirmative votes in successive general elections. Therefore, the Nevada voters must approve the question again in 1980 for the Legislature to act in 1981. The proposed amendment provides the following features.

1. Establishes a maximum one per cent tax rate on the full cash value of property;

2. Defines "full cash value" as that value established for the 1975-76 fiscal year plus a maximum two per cent inflationary increase;

3. Requires a current appraised value to be placed on the property for new construction and sales during the year of construction or sale.

4. Provides a two-thirds voting rule for legislative increases in non-property taxes; and

5. Provides a two-thirds voting rule for local electorate increases in non-property taxes.

Facing the threat of Question 6, the Legislature made tax cuts amounting to $244 million over the 1979-81 biennium to avoid the obvious inequities in the proposed constitution revision. The Legislative cut exceeds that offered in Question 6 with much of the reduction being financed from the State's surplus. The Legislature preferred to couple tax reduction with tax reform. They were concerened that two neighbors could have different assessed values placed on their identical properties, depending on when the property was purchased. Likewise, they were concerned that corporate-owned property does not change ownership as residential property does, thus, such properties as public utilities would never be reappraised. Also, Question 6 provided no assurance that renters would benefit from the tax reduction. In short, property tax equalization would be impossible to achieve.

The Legislature enacted a five point tax reform package in May, 1979, in hopes that Question 6 will be rejected in 1980. If Question 6 is finally approved the legislative package will self-destruct. First is an across-the-board tax reduction from $5.00 to $3.64 per $100 of assessed valuation.[40] The ratio of assessed value to market value remains at 35 per cent, which reduces the effective tax rate from 1.75 per cent of full cash value to 1.27 per cent. Second, certain personal property will be exempt from property taxation. This includes business inventory, livestock and household personal property. These exemptions were allowed by a Constitutional amendment which was approved by the voters in November, 1978. Third, a provision requiring landlords to refund a part of their tax savings to tenants was enacted. Fourth, the sales tax on food for home consumption was repealed by a popular vote on June 5, 1979. This vote was made necessary because the original sales tax was approved by a referendum vote in 1955. Fifth, limits were placed on spending of non-school, local governments, and limits were placed on local revenues for school districts.

Property Taxes Before Question Six

Before proceeding with a discussion of the reform and its effect on school finance, it is necessary to describe briefly Nevada's property tax system prior to the changes because of the significance of property tax revenues in school funding. All real and personal property and possessory interests are to be uniformly and equally assessed according to Section 10 of the Nevada Constitution. The Constitution also limits the combined rate for cities, counties, schools, special districts, and the State to $5.00 per $100 of assessed value. The ratio of assessed value to market value is limited by statute to 35 per cent. Hence, no taxpayer is subject to more than 1.75 per cent rate on full cash value. Each taxing jurisdiction estimates their spending needs and how much must be financed with property tax revenues. They then determine the necessary rate given their tax base. If the combined rate exceeds $5.00, the jurisdictions sit together to negotiate a reduction to bring the rate within the limit. If they fail, the State Tax Commission makes the adjustment. Since everyone is subject to the state, county and school district levy, those properties outside of cities and special districts pay less than the $5.00 limit. The State receives 25 cents of the $5.00 for the General Fund, plus the State takes 11 cents for the statewide medically indigent program for a total State share of 36 cents.

School districts are guaranteed $1.50 of the $5.00. This left $3.14 for non-school local governments. Since schools, counties and special districts are more dependent on the property tax than the State or cities, a reduction across-the-board to one per cent as porposed in Question 6 would have more impact on the former entities than on the latter.

One of the concerns people have with the property tax is that as the base rises with inflated property values, tax rates have been increased as well. This has not been, and cannot be the case in Nevada since the maximum rate is fixed. The base drifts up with inflation because the county assessor is required to reassess each property at least every five years in order to maintain equalization. However, in some rapidly growing counties this cycle has not been maintained because the assessor's staff is not sufficient to cover new construction and reassessments. Consequently, during the present inflationary period property owners have enjoyed a windfall during the years between assessments.[41]

Appointed county equalization boards are required to review assessments annually and hear taxpayers' appeals. The State Board of Equalization serves a similar function, but has the additional function of reviewing the ratio study of each county to ensure that each county is at the required 35 per cent ratio or assessed to market values in order to protect the State School Distributive Fund. If a county is underassessing property, that county school district would receive more state aid because of the relaxed tax effort. The State can require a county to assess the property in order to bring its valuation up to 35 per cent.

Considerable property has been provided special treatment or exempted by amendments to Section 10 of the Constitution. Agricultural land can be taxed at use value rather than market value with a penalty levied if the land is converted to non-agricultural use. Nevada's Net Proceeds Tax on mineral rights or mineral deposits is in lieu of ad valorem taxes. Property for charitable societies is exempted, and this list tends to increase over time. Business inventories for sale out of state are exempted by a freeport provision. A Constitutional amendment enacted in 1979 exempts all business inventories, livestock and household furnishings. The result of all of these provisions is to narrow the tax base.

Because of the rate limit, the reassessment lag, and the narrowing of the tax base due to exemptions and special treatment, real, per capita property tax revenues actually declined between 1970 and 1977.[42] A study of fiscal conditions of cities and counties in Nevada completed in 1978, found that these local governments were less dependent on the property tax in 1977 than in 1970.

The reason for this trend is that property taxes had relatively low population elasticities compared to expenditures for cities and counties.[43] The gap between property tax revenues and city and county expenditures was not closed by other local revenue sources, but by increasing Federal and State grants. What has happened is that State general fund revenues such as the gross revenue tax on gaming and the general sales tax respond well to population growth and inflation. Local governments and schools in particular are dependent on the relatively unresponsive property tax. Consequently, the State has been experiencing a healthy and growing surplus, which has not been the case for local governments. Instead, local governments have found the demand for their services to be driven up by population growth, and their own revenue sources to be depreciated by inflation. Thus, they find themselves dependent on revenues from higher levels of government with more elastic tax bases.

Property tax reduction heralded as property tax reform has become one of the most popular public issues in Nevada as well as around the nation in 1978. One of the concerns is that the property tax is levied on wealth which may not coincide with the flow of income of the taxpayer. While wealth and income are measures of ability to pay taxes, it is income which measures the immediate ability to pay taxes when due. However, Nevadans have steadfastly rejected a tax on income. In a simpler, less inflationary economy a tax on property was a reasonable measure of the ability to support government, as well as a reasonable indicator of benefits received from government. In an inflationary economy property values rise which allow property tax liabilities to rise. This process falls hardest on those who have accumulated non-income property, e.g., owner-occupied residences, but because of such circumstances as age or health, find themselves on a fixed income. The combined effects of inflationary impacts on property values and fixed incomes has contributed to emotional campaigns to reduce the reliance on property taxes.

There is a popular notion that an across-the-board tax reduction on real property will simply be passed on to the benefit of consumers, renters and homeowners. Economic theory and empirical research suggests a more complicated process. The best evidence demonstrates that a reduction in taxes on real property tends to increase the market price of the asset in the short run for a windfall to the existing property owner. For example, the net effect would be an increase in the value of rental property as a reaction to the tax reduction with little if any net benefits to consumers or renters.

Additional reasons were the existence and growth of the State surplus, an attempt by the people to deal with inflation, and the ability to take advantage of neighboring California's tax reduction campaign. One of the contributions to the State surplus is the method used to compute the State's share of the Nevada School Plan. The State Budget Office tends to be quite conservative in forecasting revenues for each biennium. They have consistently underestimated local revenues for schools including the mandatory 70 cent property tax and the one cent Local School Support Tax on sales. This underestimation requires more to be budgeted for the School Distributive Fund than will be used to meet the minimum per pupil support level. Therefore, at the end of each year money reverts from the School Distributive Fund to the General Fund which adds to the surplus. There is a tendency to be even more conservative in forecasting the revenues for the second year of the biennium than the first. School lobby groups have in recent years won a concession from the Legislature to trigger more money into school support if State revenues rise more than the forecast. With respect to California's experience, California does not represent a reliable model for Nevada. Nevada has had a cap on property tax rates all along. Also, there is no income tax in Nevada which is quite responsive to inflation and growth with which to rebuild the State surplus. Nevertheless, whatever the reasons for the tax movement the likely result will be an increasing centralization of expenditures and programs, particularly for schools in Nevada.

Tax Reform and the Nevada Plan

As noted above, the 1979 session of the Legislature passed an alternative tax package to that offered in Question 6. The Legislative package becomes effective immediately, and will self-destruct if Question 6 is finally passed. The effect of the total package will have substantial impact on the Nevada school finance plan adopted in 1967. First, the across-the-board tax rate reduction from $5.00 to $3.64 will take place in the following way. The State will give up its claim of 25 cents for the general fund and 11 cents for the State Assistance for the Medically Indigent Fund. The remaining $1.00 reduction will be effected by reducing the school district's levy of $1.50 per $100 of assessed value to 50 cents. The loss to the school districts will be made up by the State. Remember, the school district had two separate property tax levies; a 70 cent mandatory levy which counted as local revenue to substitute for State aid, and an 80 cent optional levy which could supplement local and State support. In other words, the greater the 70 cent revenues in a particular district, the less the State support, but the 80 cent revenues had no effect on State support. Under the new plan the State will make up the entire loss of the 70 cent mandatory levy and 30 cents of the 80 cent levy. However, there is a cap on the use of the 50 cents. While cities and counties had a cap placed on spending by the Legislature, the school districts fought for a revenue cap instead. The revenue cap will be 80 per cent of the five year moving average of the

Consumer Price Index and enrollment on the 50 cent optional tax. Hence, most districts will not be able to levy the entire 50 cents. It is interesting to note that although Carson City received $30 in 1979-80 for an extra low wealth allotment, it will only by able to levy 37 cents of the optional 50 cents in that year due to the revenue cap. The School Distributive Fund will not be included in the cap. Tables 9 and 10 depict the method the Department of Taxation proposes to administer the cap.

The Legislature, however, protected its General Fund by enacting a trigger mechanism which restrains State support if "relevant" State revenues do not increase at a prescribed rate. The relevant taxes are the two cent sales tax and the tax on gross gaming revenue. If the combined increase in yield in these taxes for 1980-81 is 10 to 12 per cent, the State will contribute from the General Fund to the School Distributive Fund the equivalent of the total 30 cent levy. (See Table 11) The combined property tax rate could not exceed $3.64. If the combined increase is only 8 to 9 per cent, for example, the State will only contribute the equivalent of 20 cents, and the combined rate could rise to $3.77 by allowing a school district to levy an optional rate of 67 cents rather than 50 cents. If there is a loss of State funds due to this trigger provision, school districts can make up the shortfall from their optional tax if there is capacity within the rate limit. If there is no increase in relevant State revenues, the school rate can reach 80 cents rather than 50 cents, and the maximum combined rate

SCHOOL DISTRICT LEVY LIMITATION*

State will replace the mandatory 70 cent levy with money appropriated to the Distributive School Fund.

State will provide additional tax relief by replacing part of the optional 80 cent levy with money appropriated to the Distributive School Fund.

Cap will apply to the amount of the optional 80 cent rate actually levied. The amount of the 80 cent rate replaced by the state will be unrestricted.

Base Period is the average of three fiscal years. The three fiscal years for first year of the cap are 1975-76, 1976-77, and 1977-78. Each ensuing year base period is calculated by dropping the oldest fiscal year and adding the recent consecutive fiscal year.

Base is the amount obtained by multiplying optional levy (this will be 80 cents per $100 or less) by the school district assessment for the base period (this will yield a 3-year average).

Base Enrollment is the enrollment for the base period (this will yield a 3-year average).

Measure of Enrollment Change is the index of change in enrollment in the current year from base enrollment.

Measure of Inflation or Deflation is 80 per cent of the average annual percentage of inflation or deflation for the 60 months preceding the month of November preceding the year for which the permissible levy is being calculated.

*Source: Nevada Department of Education

Table 9

COMPUTATION OF SCHOOL DISTRICT SPENDING LIMITATIONS

County: Carson City Date: ____
Person preparing form: ____ Phone: ____
Address: ____

I. ASSESSED VALUATION

1975-76 $ 103,081,217
1976-77 $ 119,511,647
1977-78 $ 171,766,470
TOTAL (A) $ 394,359,334
Line (A) ÷ 3 = (B) $ 131,453,111.30 (average assessed valuation)

Line (B) x .005 = (C) $ 657,265.56 BASE DOLLAR AMOUNT

II. PUPIL ENROLLMENT

1975-76 5,579
1976-77 5,603
1977-78 5,913
TOTAL (D) 17,095
Line (D) ÷ 3 = (E) 5,698.33 (base enrollment)

Current enrollment (F) 6,053
Line (F) 6,053 ÷ Line (E) 5,698.33 = (G) 1.06224 % (increase or decrease)

III. CALCULATIONS

1) Line (C) $657,265.56 x Line (G) 1.06224 % = (H) $698,173.77 (First increment)
2) Line (H) $698,177.77 x 1.0749 (CPI) = (I) $ 750,466.98 (Second increment)

3) Line (I) $750,466.98 ÷ 201,357,258 (1978-1979 assessed valuation) = (J) $ .003727 (Millage)

4) Line (J) $ .003727 x 100 = (K) $ .3727

Line (K) IS THE MAXIMUM TAX LEVY FOR FISCAL YEAR 1979-80
(This may not exceed 50 cents)

SOURCE: Nevada Department of Taxation

Table 10

COMPUTATION OF SCHOOL DISTRICT SPENDING LIMITATIONS

County: Storey Date: ____
Person preparing form: ____ Phone: ____
Address: ____

I. ASSESSED VALUATION

1975-76	$ 8,044,211
1976-77	$ 9,823,776
1977-78	$ 10,165,152
TOTAL	(A) $ 28,033,139

Line (A) ÷ 3 = (B) $ 9,344,380
(average assessed valuation)

Line (B) x .005 = (C) $ 46,722
BASE DOLLAR AMOUNT

II. PUPIL ENROLLMENT

1975-76	141
1976-77	155
1977-78	158
TOTAL	(D) 454

Line (D) ÷ 3 = (E) 151.33
(base enrollment)

Current enrollment (F) 187

Line (F) 187 ÷ Line (E) 151.33 = (G) 1.236 %
(increase or decrease)

III. CALCULATIONS

1) Line (C) $ 46,722 x Line (G) 1.236 % = (H) $ 57,748
(First increment)

2) Line (H) $ 57,748 x 1.0748 (CPI) = (I) $ 62,068
(Second increment)

3) Line (I) $ 62,068 ÷ 13,652,029 (1978-1979 assessed valuation) = (J) $ .004546
(Millage)

4) Line (J) $ .004546 x 100 = (K) $ .4546

Line (K) IS THE MAXIMUM TAX LEVY FOR FISCAL YEAR 1979-80
(This may not exceed 50 cents)

SOURCE: Nevada Department of Taxation

Table 11

COMPUTATION OF STATE OFFSET OF OPTIONAL 30 CENT LEVY

Growth in Relevant State Taxes[a]		State's Contribution to Offset Loss of Optimal 30 Cent Levy	School Levy (Cents per $100)	Maximum Combined Rate
Equal to or greater than	But less than			
----------	2 per cent	.0000	$0.80	$3.94
2 per cent	3 per cent	.0001	.79	3.93
3 per cent	4 per cent	.0004	.76	3.90
4 per cent	5 per cent	.0007	.73	3.87
5 per cent	6 per cent	.0010	.70	3.84
6 per cent	7 per cent	.0013	.67	3.81
7 per cent	8 per cent	.0017	.63	3.77
8 per cent	9 per cent	.0020	.60	3.74
9 per cent	10 per cent	.0023	.57	3.71
10 per cent	12 per cent	.0030	.50	3.64
12 per cent	13 per cent	.0032	.48	3.62
13 per cent	14 per cent	.0035	.45	3.59
14 per cent	15 per cent	.0038	.42	3.56
15 per cent	16 per cent	.0042	.38	3.52
16 per cent	17 per cent	.0045	.35	3.49
17 per cent	-----------	.0048	.32	3.46

(a) Relevant taxes are the two cent sales tax and gross gaming revenue.

can reach $3.94 rather than $3.64 per $100 of assessed value. With normal economic conditions the actual rate will be below $3.64 because of the spending and revenue caps.

The effects of the 1979 tax package will be to increase the proportion of State to local funding of schools, but with little, if any, real impact on equalization of support per pupil. The State will fund the loss of the mandatory 70 cent levy from the Local School Support Tax minus the tax on food. This will still be the local resources the State will equalize. In addition, the State will make up for the loss of 30 cents of the optional property tax, and allow the districts to levy the remaining 50 cents within the revenue cap. But all of this increased State aid is returned on the basis of local assessed value or taxable sales. Moreover, the funding of the 30 cents of the optional tax will direct more State aid to wealthy districts. The only move to reduce inequality will be brought about by the revenue cap. The effect of the cap is to level down rather than to level up.

V

CONCLUDING OBSERVATIONS

In this paper we have described the evolution of the State's role in local school finance along with a critique of the Nevada Plan. The State has developed a system to minimize wealth-related expenditure disparities among districts, and to provide for special program needs through a formula apportionment. Because of the disparate demographic characteristics of Nevada, it is difficult to construct a formula which will distribute funds to meet all of the objectives stated in the Plan. One of the main premises of this study is that the tax reform movement must be made consistent with the aims of the Nevada Plan. The following are some of the specific areas where we believe the formula does not meet its objectives.

First, there has not been an adequate case made for the "urban factor" which makes extra allotments of teachers to the largest schools. Secondary schools of enrollments of 3,200 are allowed a student-teacher ratio of 22 to 1, whereas a school of more than 3,200 operates at a 21 to 1 ratio. Is this because large schools are less efficient than medium-sized schools, or are there special program needs of the largest schools? The rationale should be stated and supported with research. A related concern is the allocation of more non-teaching certified positions per pupil as enrollment increases.

Second, the Plan does not explicitly recognize the problem of the education of minorities. The Plan does make extra allocations for Special Education Program Units for the handicapped. One of the issues that makes this provision difficult to evaluate is that some education officials believe that the urban factor is designed to aid schools with large minority populations. Better documentation is needed to support this contention.

Third, the special low wealth allocation factor does not work. The objective of this additional apportionment for low wealth is to ensure that each district will have total resources per pupil of at least 80 per cent of what they would have if all resources statewide were apportioned as Equalized Basic Support is apportioned. When the formula is applied for this factor such wealthy districts as Clark County (Las Vegas) would receive an extra apportionment. The problem is probably caused by applying a formula to a statewide system of only seventeen districts. Statewide averages will be dominated by Clark and Washoe which have 80 per cent of the pupils. Rather than rigidly apply the formula, the superintendents have wisely negotiated the low wealth apportionments. The recognition of a need for extra low wealth apportionment suggests that Basic Equalized Support is not meeting the objective. Rather than to continue to negotiate the low wealth apportionments, we recommend that the basic formula be redesigned. This could be accomplished by including more of the local resources within equalized support. For instance, 53 per cent of the property tax revenues are not equalized in the Plan.

Fourth, the tax reform of 1979 will have a major impact on the relative participation of the State and local districts in financing education. The local property tax for school support will be reduced from $1.50 per $100 of assessed value to a maximum of 50 cents. The shortfall will be made up by the State from non-property tax revenues. Unfortunately, the same proportion of revenues will be equalized even though more will come from statewide resources. The consequence will be that the State will direct an equivalent of 30 cents per $100 of assessed value on the basis of assessed value. Thus, a wealthy district will receive more State aid than a poor district. We recommend that consideration be given to including the entire $1.00 shortfall within Equalized Basic Support rather than continuing to include the equivalent of 70 cents within the formula. This action would bring at least two-thirds of revenues based on assessed value within Equalized Basic Support as compared to only 47 per cent now. We say at least "two-thirds" because the revenue cap, which will limit the local property tax rate, will reduce the optional tax rate below 50 cents in most cases.

Finally, the question of intra-district equalization is an important one in Nevada with seventeen county-wide districts. Because of the lack of data we have not investigated this issue. The issue of the appropriate balance between local and State administration will be increasingly important as the State increases its share of school finances. Local districts will need to convince the electorate that the objectives of the Nevada

Plan are being met within the district as well as among districts. We have no evidence that this is not the case, but the data should be routinely generated.

FOOTNOTES

[1] Susan Furham, "The Politics and Process of School Finance," Journal of Education Finance (Fall, 1978), p. 164.

[2] Ibid.

[3] Warren Weaver, Jr., "The Revolution in School Finance," The Journal of the Institute of Socioeconomic Studies (January, 1979), p. 15.

[4] George M. Raymond, "The Future of the Property Tax in Education Finance," in Richard W. Lindholm, ed., Property Taxation and the Finance of Education (Madison: The University of Wisconsin Press, 1974), p. 113.

[5] Lawrence L. Brown, III, et. al., "School Finance Reform in the Seventies: Achievements and Failures," Journal of Education Finance (Fall, 1978), p. 205.

[6] Weaver, "Revolution in School Finance," p. 16.

[7] G. D. Strayer and R. M. Haig, The Financing of Education in the State of New York (New York: MacMillan, 1924).

[8] Brown, "School Finance," p. 211.

[9] Lazlo L. Ecker-Racz, "Public Schools in the Wake of Proposition 13," Today's Education (April/May, 1979).

[10] Ibid., p. 67.

[11] Weaver, "The Revolution in School Finance," p. 21.

[12] Ecker-Racz, "Public Schools," p. 67.

[13] James Gregg, "The Impact of Proposition 13 on Public Education in California," Nevada Public Affairs Review (March, 1979), p. 59.

[14] Nebraska Public School Finance Study (Lincoln: The Nebraska Department of Education, 1978), p. 251.

[15] W. Craig Stubblebine and Ronald K. Teeples, "California and the Finance of Education: Alternatives in the Wake of *Serrano v. Priest*," in Richard W. Lindholm, ed., *Property Taxation and the Finance of Education* (Madison: The University of Wisconsin Press, 1974), p. 165.

[16] Richard W. Lindholm, "Conference Hour Discussion," in *Ibid*., p. 314.

[17] Quoted in Jim B. Pearson and Edgar Fuller, *Education in the States: Historical Development and Outlook* (Washington: National Education Association, 1969), p. 769.

[18] Nevada School Finance Survey Group, *Financial and Administrative Problems of Nevada Schools and Suggested Solutions* (Carson City: State Printing Office, 1948), p. 9.

[19] *Ibid*.

[20] *Ibid*., pp. 24-25.

[21] *Ibid*., pp. 14-16.

[22] *Ibid*., pp. 30-33.

[23] *Ibid*., p. 31

[24] *Ibid*., p. 33.

[25] Pearson, *Education*, p. 772.

[26] *Ibid*., p. 773.

[27] Don W. Driggs, "Taxation and the Financing of Education in Nevada," in Eleanore Bushnell, ed., *Sagebrush and Neon* (Reno: Bureau of Governmental Reasearch, University of Nevada, 1973), pp. 75-91.

[28] *Nevada Plan for Support of Public Education* (Carson City: Nevada Department of Education, January, 1979), p. 1.

[29] *Ibid*., p. 4.

[30] *Ibid*., pp. 3-4.

[31] Ellwood P. Cubberly, School Funds and Their Apportionment (New York: Teachers College Press, 1905), p. 17.

[32] In 1956, the Legislature consolidated school districts, so each of Nevada's 17 counties is a separate school district.

[33] Carson City, Churchill, Lincoln, Lyon, Mineral.

[34] Peter Steinmann and Richard Ganzel, "The Funding of Public Education in Nevada," Nevada Public Affairs Review (March, 1979), pp. 63-65.

[35] James S. Coleman, et. al., "Equality of Educational Opportunity," (Washington: Government Printing Office, 1966); Samuel S. Bowles, Education Production Function, U.S. Office of Education (Cambridge: Harvard University Press, 1969).

[36] R. H. Mathers; Nevada Needs Assessment (Carson City: Nevada Department of Education, 1973-74).

[37] Aaron Wildavsky, The Politics of the Budgetary Process (Boston: Little Brown and Company, 1974).

[38] The counties that do not impose the full 80 cent tax apply most of it.

[39] Allan Odden, Alterative Measures of School District Wealth (Education Finance Center Report No. F-76-6, December, 1976), pp. 10-13.

[40] The Senate attempted to offer a greater reduction for residential property than for business property. The across-the-board reduction provision of the Assembly Bill prevailed because of the threat of judicial review.

[41] Some of the resentment toward the property tax is caused by the sharp increases in assessments due to infrequent reassessments. There have been proposals that the State should require annually adjusted assessments. For residential property this would be done with computer assisted techniques, which would free up staff to work on non-residential property. See Ronald Shane, et. al. "Real Property Taxation in Nevada: Current Legislation and Annual Assessment," Nevada Review of Business and Economics (Winter, 1978-79), pp. 28, 30.

[42] Glen W. Atkinson, et. al. "Nevada Local Government Finance Study: Final Report," (Carson City: Legislative Counsel Bureau, December, 1978), p. 33.

[43] *Ibid*., p. 106. Population elasticity is the ratio of the percentage change in revenue to the percentage change in population. For example, assume an estimate of population elasticity of property tax revenues equal to 0.80. This estimate indicates that a one per cent increase in total expenditures will be associated with a 0.80 per cent increase in property tax revenues, a two per cent increase in population will be associated with a 1.60 per cent increase in property tax revenues.

APPENDIX I

CORRELATIONS ON POOLED DATA

1) Actual expenditures per pupil by district.
2) Actual State Distributive Fund expenditures per pupil by district.
3) Per capita income by district.
4) Per pupil assessed value by district.

5 years (197301977) X 17 districts = 85 observations

Correlations were:

	(1)	(2)	(3)
(2)	+.398		
(3)	-.265	-.383	
(4)	+.866	-.015	-.196

APPENDIX II

EXPENDITURES, DISTRIBUTIVE FUND, PER CAPITA INCOME AND ASSESSED VALUES BY COUNTY, 1973-74 to 1977-78

COUNTY	EXPENDITURE PER PUPIL	DISTRIBUTIVE FUND PER PUPIL	PER CAPITA INCOME	ASSESSED VALUE PER PUPIL
CARSON CITY				
1973-74	1,046	556	5,178	13,075
1974-75	1,021	517	5,487	14,643
1975-76	1,243	642	5,851	16,144
1976-77	1,257	639	6,421	18,398
1977-78	1,365	670	7,036	20,212
CHURCHILL				
1973-74	1,064	570	5,035	13,157
1974-75	1,163	582	5,368	15,259
1975-76	1,424	675	5,392	17,022
1976-77	1,424	709	5,814	17,869
1977-78	1,559	804	6,057	19,404
CLARK				
1973-74	1,102	438	5,399	17,618
1974-75	1,066	439	5,845	19,310
1975-76	1,385	548	6,350	21,128
1976-77	1,323	561	6,883	22,348
1977-78	1,482	631	7,509	24,131
DOUGLAS				
1973-74	1,027	169	6,852	35,151
1974-75	1,147	199	7,347	39,679
1975-76	1,460	267	7,618	43,405
1976-77	1,397	333	8,024	43,491
1977-78	1,574	246	8,753	53,210
ELKO				
1973-74	1,258	432	5,453	27,528
1974-75	1,295	477	5,633	32,433
1975-76	1,619	543	5,880	37,827
1976-77	1,611	566	6,334	41,364
1977-78	1,811	704	7,142	42,211
ESMERALDA				
1973-74	2,349	1,075	3,608	95,904
1974-75	2,605	1,195	3,787	85,986
1975-76	2,817	1,213	4,536	92,409
1976-77	2,946	983	5,061	108,597
1977-78	3,507	1,071	5,411	111,178
EUREKA				
1973-74	2,471	325	3,939	89,371
1974-75	2,212	251	3,759	94,956
1975-76	2,551	311	4,046	111,647
1976-77	3,143	167	4,791	193,390
1977-78	3,802	597	5,784	170,043
HUMBOLDT				
1973-74	1,304	506	4,707	23,580
1974-75	1,201	497	5,092	25,522
1975-76	1,673	629	5,531	30,920
1976-77	1,567	616	5,928	34,505
1977-78	1,808	738	6,122	37,939

APPENDIX II (Continued)

COUNTY	EXPENDITURE PER PUPIL	DISTRIBUTIVE FUND PER PUPIL	PER CAPITA INCOME	ASSESSED VALUE PER PUPIL
LANDER				
1973-74	1,270	435	4,796	29,647
1974-75	1,184	379	5,376	29,560
1975-76	1,507	557	5,664	30,420
1976-77	1,514	635	5,737	30,127
1977-78	1,848	731	5,954	35,722
LINCOLN				
1973-74	1,448	1,023	3,783	17,091
1974-75	1,663	1,055	4,197	18,412
1975-76	1,832	1,115	4,673	20,873
1976-77	2,018	1,187	4,816	25,119
1977-78	2,119	1,270	5,497	25,521
LYON				
1973-74	1,262	555	4,138	24,287
1974-75	1,188	530	4,436	26,557
1975-76	1,527	686	5,189	31,115
1976-77	1,415	685	5,540	29,225
1977-78	1,614	826	5,858	31,140
MINERAL				
1973-74	1,175	624	4,637	10,035
1974-75	1,346	707	4,893	12,199
1975-76	1,417	762	5,299	13,780
1976-77	1,547	763	5,745	15,957
1977-78	1,779	956	6,341	17,511
NYE				
1973-74	1,421	625	4,557	35,997
1974-75	1,573	680	4,670	36,323
1975-76	1,715	795	4,971	41,719
1976-77	1,851	816	5,260	45,926
1977-78	2,178	956	5,646	55,336
PERSHING				
1973-74	1,213	340	6,157	40,344
1974-75	1,223	379	6,532	40,800
1975-76	1,423	513	6,604	43,708
1976-77	1,546	508	6,689	50,552
1977-78	1,692	570	6,529	53,130
STOREY				
1973-74	1,743	565	4,477	54,803
1974-75	1,400	784	4,650	48,608
1975-76	1,642	828	4,900	55,378
1976-77	1,844	920	4,996	51,898
1977-78	2,209	1,037	5,387	62,176
WASHOE				
1973-74	1,108	337	6,175	23,231
1974-75	1,067	340	6,608	26,222
1975-76	1,376	418	7,209	29,118
1976-77	1,308	433	8,004	29,971
1977-78	1,503	447	9,007	35,172
WHITE PINE				
1973-74	1,233	527	4,596	20,900
1974-75	1,192	550	4,971	22,260
1975-76	1,368	740	5,312	19,811
1976-77	1,472	723	5,208	22,271
1977-78	1,668	840	6,105	25,080

APPENDIX III

WORKSHEETS ON NEVADA PLAN FOR FY 77-78

COUNTY	KDGN.		ELEM.	SEC.	SUB TOTAL	SPEC. ED.	TOTAL WTD. ENROLL.	1976-77 WTD. ENROLL.	BASIC SUPPORT GUAR.	GUARANTEED BASIC SUPPORT	SPEC. ED UNITS	X $17,600	TOTAL GUARANTEED BASIC SUPPORT
	Full	Wtd.											
CARSON CITY	372	223.2	2,471	2,927	5,621.2	292	5,913.2	5,603.2	$1,026	$ 6,066,943	23	$ 404,800	$ 6,471,743
CHURCHILL	175	105	1,338	1,139	2,582	161	2,748	2,717	1,025	2,811,575	11	193,600	3,005,175
CLARK	5,526	3,315.6	34,928	39,773	78,016.6	4,107	(-4) 82,119.6	80,646.2	1,022	83,926,231	348	6,124,800	90,051,031
DOUGLAS	154	92.4	1,747	1,063	2,902.4	129	(-36) 2,995.4	2,720	1,020	3,055,308	11	193,600	3,248,908
ELKO	233	139.8	1,670	1,642	3,451.8	147	(-32.2) 3,566.6	3,649.6	1,105	4,032,808	17	299,200	4,332,008
ESMERALDA	13	7.8	86	---	93.8	20	(+1) 114.8	121.4	1,954	237,216	(+5/9) 1	27,378	264,594
EUREKA	7	4.2	80	85	169.2	9	178.2	201.2	1,763	354,716	2	35,200	389,916
HUMBOLDT	91	54.6	725	746	1,525.6	108	(-9.2) 1,624.4	1,685.4	1,152	1,941,581	8	140,800	2,082,381
LANDER	60	36	433	347	816	32	848	863	1,087	938,081	4	70,400	1,008,481
LINCOLN	62	37.2	438	369	844.2	9	853.2	767.2	1,461	1,246,525	5	88,000	1,334,525
LYON	174	104.4	1,069	1,071	2,244.4	107	2,351.4	2,364.6	1,087	2,570,320	(-4/9) 11	183,822	2,754,142
MINERAL	89	53.4	649	606	1,308.4	50	(+3) 1,361.4	1,417.4	1,044	1,479,766	6	105,600	1,585,366
NYE	59	35.4	592	738	1,365.4	72	1,437.4	1,358.8	1,378	2,020,351	8	140,800	2,161,151
PERSHING	48	28.8	323	311	622.8	24	686.8	682.6	1,039	713,585	3	52,800	766,385
STOREY	9	5.4	78	73	156.4	2	158.4	155	1,654	261,994	1	17,600	279,594
WASHOE	1,841	1,104.6	11,813	17,281	30,198.6	998	(-16) 31,180.6	30,868.8	1,007	31,398,864	132	2,323,200	33,722,064
WHITE PINE	141	84.6	796	941	1,821.6	112	(+11) 1,944.6	1,924.2	1,141	2,218,789	9	158,400	2,377,189
TOTALS	9,054	5,432.4	59,285	69,112	133,829.4	6,330	(-82.4) 140,077	137,745.8	1,034.84	145,274,653	600	$10,560,000	$155,834,653

APPENDIX III (Continued)

COUNTY	ASSESSED VALUATIONS	X .007	1¢ SCHOOL SUPPORT TAX	TOTAL LOCAL FUNDS AVAILABLE	TOTAL STATE SUPPORT FOR FOUR QUARTERS	AMOUNT PREVIOUSLY PAID FOR 1977-78	AMOUNT DUE FOR FY 77-78 (+) or (-)
CARSON CITY	119,511,647	836,582	1,691,515	2,528,097	$ 3,943,646	3,955,747	$ (12,101)
CHURCHILL	53,379,773	373,658	463,641	837,299	2,167,876	2,164,867	3,009
CLARK	1,982,244,725	13,875,713	24,732,035	38,607,748	51,443,283	51,246,670	196,613
DOUGLAS	159,365,708	1,115,560	1,397,663	2,513,223	735,685	822,358	(86,673)
ELKO	153,329,344	1,073,305	829,906	1,903,211	2,428,797	2,430,810	(2,013)
ESMERALDA	18,333,363	128,333	13,090	141,423	123,171	115,122	8,049
EUREKA	38,154,174	267,079	24,078	291,157	98,759	104,408	(5,649)
HUMBOLDT	62,827,311	439,791	444,796	884,587	1,197,794	1,196,414	1,380
LANDER	35,262,799	246,839	142,125	388,964	619,517	629,735	(10,218)
LINCOLN	21,697,422	151,882	102,773	254,655	1,079,870	1,085,245	(5,375)
LYON	73,242,434	512,697	330,782	843,479	1,910,663	1,895,481	15,182
MINERAL	23,932,375	167,527	162,970	330,497	1,254,869	1,259,302	(4,433)
NYE	85,631,361	599,420	187,363	786,783	1,374,368	1,330,794	43,574
PERSHING	36,979,659	258,858	115,048	373,906	392,479	391,347	1,132
STOREY	9,839,848	68,879	46,916	115,795	163,799	164,611	(812)
WASHOE	1,096,868,945	7,678,083	12,286,839	19,964,922	13,757,142	13,825,020	(67,878)
WHITE PINE	49,111,827	343,783	399,007	742,790	1,634,399	1,623,169	11,230
TOTALS	4,019,712,715	28,137,989	43,470,547	71,508,536	$84,326,117	84,241,100	$ 280,169

APPENDIX IV

TEACHER ALLOTMENT TABLES, RELATED ALLOCATIONS, AND VALUES*

Teacher Units for Elementary Pupils

Enrollment From	-	To	Number of Teachers	Pupil/Teacher Extremes	
3	-	12	1	3	12
13	-	27	2	6.5	13.5
28	-	44	3	9.3	14.9
45	-	66	4	11.2	16.5
67	-	90	5	13.2	18
91	-	120	6	15	20
121	-	152	7	17.2	22
153	-	192	8	19	24
193	-	4,800	divide by 26, but not less than 9	21.5	26
4,801	-	14,400	divide by 25	25	
14,401 or more			divide by 24	24	

Teacher Units for Secondary Pupils

Enrollment From	-	To	Number of Teachers	Pupil/Teacher Extremes	
Not more than 45			5	---	9
46	-	54	6	7.6	9
55	-	77	7	7.9	11
78	-	104	8	9.8	13
105	-	135	9	11.7	15
136	-	170	10	13.6	17
171	-	209	11	15.5	19
210	-	252	12	17.5	21
253	-	3,200	divide by 22, but not less than 12	22	
3,201 or more			divide by 21	21	

II. Special Education Program Units -

For 1979-80, one for every 9 teacher allocations
For 1980-81, one for every 8.6 teacher allocations

III. Other Certified Staff Allocations -

For districts of less than 600 enrollment, one for every 5 teacher allocations
For districts of 600-1200 enrollment, one for every 4 teacher allocations
For districts of more than 1200 enrollment, one for every 3 teacher allocations

*Source: Nevada Department of Education, "Nevada Plan for Support of Public Education"

APPENDIX IV (Continued)

SUPPORT VALUES FROM TEACHER-AND OTHER CERTIFICATED EMPLOYEE ALLOTMENTS AND FROM PUPIL ENROLLMENTS; SUPPORT VALUES PER PUPIL; RATIOS OF SUPPORT VALUES

Districts	1st month FY77-78 Pupils Total Wtd. Enrollment	Total Tchr. & other Cert. Empl. Allot.	$11,900 x Cert. Empl. Allotments	$136 x Elem. Enroll. (K x 6)	$190 x Secondary Enroll.	Total Support Value	Total Value Per Pupil	Ratio to Lowest P/P Value	Ratio to Wtd. State Value P/P
Carson City	5,913.2	332	$ 3,950,800	$ 392,387	$ 575,320	$ 4,918,507	$832	1.0146	.9596
Churchill	2,743	154	1,832,600	184,688	263,150	2,280,438	831	1.0134	.9584
Clark	82,119.6	4,835	57,536,500	5,582,338	7,801,870	70,922,708	864	1.0536	.9965
Douglas	2,995.4	171	2,034,900	198,342	292,030	2,525,272	843	1.0280	.9723
Elko	3,566.6	229	2,725,100	254,266	322,430	3,301,796	926	1.1292	1.0680
Esmeralda	114.8	11	130,900	15,477	190	146,567	1,277	1.5573	1.4728
Eureka	178.2	18	214,200	12,675	16,150	243,025	1,364	1.6634	1.5732
Humboldt	1,624.4	106	1,261,400	113,342	150,290	1,525,032	939	1.1451	1.0830
Lander	848	51	606,900	67,456	66,880	741,236	874	1.0658	1.0080
Lincoln	853.2	67	797,300	65,851	70,110	933,261	1,094	1.3341	1.2618
Lyon	2,351.4	141	1,677,900	165,818	215,080	2,058,818	876	1.0682	1.0103
Mineral	1,361.4	80	952,000	100,014	118,940	1,170,954	860	1.0487	.9919
Nye	1,437.4	108	1,285,200	93,078	143,070	1,521,348	1,058	1.2902	1.2202
Pershing	686.8	38	452,200	49,613	61,180	562,993	820	1.000	.9457
Storey	158.4	15	178,500	11,614	13,870	203,984	1,288	1.5707	1.4855
Washoe	31,180.6	1,814	21,586,600	2,137,729	2,937,780	26,662,109	855	1.0426	.9861
White Pine	1,944.6	122	1,451,800	132,410	184,490	1,768,700	904	1.1024	1.0426
State Totals	140,077	8,292	$98,674,800	$9,577,118	$13,234,830	$121,486,748	$ 867	1.0585	1.000

less non-residents transferred in
plus residents transferred out

Source: Nevada Department of Education

APPENDIX IV (Continued)

ENROLLMENTS, TEACHER/PUPIL ALLOCATIONS, AND RELATED COMPARISONS
FY 1977-78

Districts	Enrollment	Elementary Teacher Allotment	Secondary Teacher Allotment	Total Teacher Allotments	Other Certified Employee Allotments	Total Employee Allotments	Average Enrollment per Teacher Allotments	Average Enrollment other Cert. Allotments	Average Enrollment per Total Teacher & Other Cert. Employ. Allot.
Carson City	5913	111	137.6	248.6	82.9	332	23.78	71.32	17.81
Churchill	2743	52.2	63	115.2	38.4	153.6	23.81	71.43	17.85
Clark	82124	1677.5	1948.2	3625.7	1208.6	4834.3	22.65	67.94	17.34
Douglas	3031	56	71.6	127.6	42.5	170.1	23.75	71.31	17.81
Elko	3599	86.4	85.1	171.5	57.2	228.7	20.98	62.91	15.73
Esmeralda	114	9	---	9	1.8	10.8	12.66	63.33	10.55
Eureka	178	7	8	15	3	18	11.86	59.33	9.88
Humboldt	1634	39.4	39.6	79	26.3	105.3	20.68	62.12	15.51
Lander	848	21	19.5	40.5	10.1	50.6	20.93	83.96	16.75
Lincoln	853	26	27	53	13.3	66.3	16.09	64.13	12.86
Lyon	2351	49.9	55.8	105.7	35.2	140.9	22.24	66.78	16.68
Mineral	1358	31.1	28.5	59.6	19.9	79.5	22.78	68.24	17.08
Nye	1437	37	43.4	80.4	26.8	107.2	17.87	53.61	13.40
Pershing	687	15.7	14.6	30.3	7.6	37.9	22.67	90.39	18.12
Storey	158	5	7	12	2.4	14.4	13.16	65.83	10.97
Washoe	31197	627.6	732.9	1360.5	453.5	1814	22.93	68.79	17.19
White Pine	1934	44.4	47	91.4	30.5	121.9	21.15	63.40	15.86
State Totals	140159	2896.2	3328.8	6225	2060	8285.5	22.51	68.03	16.91

Source: Nevada Department of Education

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TAXPAYER EQUITY IN THE FINANCING OF PUBLIC SCHOOLS

by J. Richard Aronson and John L. Hilley*

I
INTRODUCTION

Recent studies in the area of school finance have concentrated attention on the problems associated with achieving a condition often referred to as categorical or expenditure equity.[1] Independent school districts, if left to themselves, can be expected to supply differing amounts of education. To the extent that these differences reflect the varying tastes and preferences of the residents of the various school districts, they can be tolerated. However, when differences in expenditure per student among school districts are caused by differences in districts' fiscal capacity, inequity is said to exist. It is now generally believed that variations in expenditure per student among the school districts of a given state should be wealth neutral and to achieve this goal state funding schemes such as DPE (district power equalizing) have been suggested.

The attempt to achieve expenditure equity has been pursued because of society's concern for the well-being of its children. It has, however, had the effect of diverting attention away from another group also worthy of equitable treatment: the taxpayers.

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[1] See, for instance, Coons, Clune, Sugarman, Private Wealth and Public Education; and M. Feldstein, "Wealth Neutrality and Local Choice in Public Education," American Economic Review, March 1975.

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Traditionally, taxpayer equity takes as its guiding principle "the equal treatment of equals." One popular application of this principle of horizontal equity is that taxpayers with the same fiscal ability should pay the same amount of taxes to support the public sector.[2] Another and perhaps more sophisticated statement is that taxpayers with the same ability should bear the same fiscal pressure. That is, the difference between benefits received and taxes paid should be the same for taxpayers with equivalent fiscal capacity.[3]

Unfortunately, the guiding principle for tax treatment among non-equals is not so precise. The general notion of "unequal treatment of unequals" leaves the door open for an infinite variety of value judgments about how individuals with unequal fiscal ability should be treated. Equity principles concerned with tax rates, fiscal pressure and utility sacrifice have all been argued for in various numerical forms.[4]

The goal of this paper is to determine whether certain school funding systems are capable of fulfilling well defined criteria for the treatment of taxpayers. We introduce alternative concepts of vertical equity concerned with the tax treatment of residents in school districts of different wealth. We then determine both theoretically and empirically the equity implications of various school funding schemes. In what follows, we shall:

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[2] Ability-to-pay can be measured in alternative ways. Income, wealth or a combination of the two are the most common measures.

[3] J.M. Buchanan, "Federalism and Fiscal Equity," American Economic Review, September 1950.

[4] See Musgrave and Musgrave, Public Finance in Theory and Practice, McGraw-Hill, New York, 1976, Ch's. 4 and 9.

- Define and describe alternative expenditure and taxpayer equity concepts.
- Describe state funding schemes that are offered as techniques for achieving wealth neutrality in the provision of education. We shall explore the conditions under which certain forms of both expenditure and taxpayer equity are attainable. The two schemes to be analyzed are DPE (district power equalizing) and the wealth neutral system of Martin Feldstein (WNS).
- Present empirically based simulations of the taxpayer burdens that would exist across school districts in Pennsylvania under alternative school funding systems.
- We will also provide a technique for analyzing how the district property mix (i.e., the relative shares of residential and nonresidential property within a district) affects local tax rates.

II.

ALTERNATIVE CONCEPTS OF EQUITY

In this section the concepts of expenditure equity, taxpayer equity and what may be called effort equity are defined. Our objective is to find out which of these equity criteria are satisfied by the various state funding schemes.

Expenditure Equity.

Expenditure equity is defined as a condition under which districts which are identical in all respects other than wealth actually spend the same amount per student. This concept of equity does not require that all districts spend the same amount per student. Districts with a strong preference for education are free to spend more.[5] However, the attainment of expenditure equity implies the elimination of wealth (or ability-to-pay) as a factor affecting the level of expenditure per student.

Taxpayer Equity.

Taxpayer equity refers to a condition under which districts with the same preference for education but different levels of wealth tax their residents at the same tax rate. The local tax rate is determined by relating the level of educational expenditures to the district's tax base.[6]. As will be seen, the level of expenditure per student undertaken by districts in response to a particular state subsidy scheme is a crucial factor in determining whether or not taxpayer equity can be attained.

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[5] The term "preferences" has a precise meaning in economic theory. Technically speaking, districts have the same preferences if their community indifference maps are identical. For a detailed examination of the concept of preferences see, for instance, R.H. Leftwich, The Price System and Resource Allocation (Holt, Rhinehold & Winston, 1976), Chs. 5,6.

[6] The local tax base is the equalized property value of the district.

Effort Equity.

Effort equity is a condition under which expenditure per student per 1% of tax rate is independent of school district wealth. Effort equity does not require that districts either spend the same amount per student or tax at the same rate. It merely requires that 1% of local tax rate levied in a poor district will generate the same amount of revenue and expenditure per student as 1% of tax rate levied in a rich district. A funding system that results in both expenditure and taxpayer equity will also produce effort equity. However, the converse is not true. A system may satisfy effort equity without satisfying either expenditure or taxpayer equity.

Neither expenditure equity nor taxpayer equity nor effort equity can be expected to exist in a system of pure local decision making. State funding systems have, therefore, been suggested to help remove some of the inequities. The two funding systems we will examine are (1) district power equalizing, and (2) Feldstein's wealth neutral system.

III.

DISTRICT POWER EQUALIZING (DPE)

To understand the implications of DPE for the treatment of taxpayers, it is necessary to describe the mechanics of the plan and examine the pattern of expenditures likely to emerge under it. The grant per student that the state awards a district under the DPE plan is given by equation (1).

$$G_i = t_i(W_k - W_i) \tag{1}$$

where

G_i = the DPE grant per student to the i^{th} district

t_i = the tax rate of the i^{th} district

W_k = the wealth per student of the key district

W_i = the wealth per student of the i^{th} district

To implement the plan, it is necessary to designate a "key district." The key district is the one which receives no state subsidy. Districts poorer than the key district receive state subsidies while those that are wealthier than the key district have a portion of their locally raised revenues recaptured.[7] Under this plan, the size of the state grant is inversely related to a district's wealth.[8]

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[7] Equation (1) shows that when $W_i > W_k$, the state grant to the i^{th} district is negative. Thus, the relatively wealthy district must locally raise more than $1 of revenue for each $1 of expenditure that it undertakes. In practice, political considerations have prevented states from adopting subsidy systems with a recapture feature. Although politically unattractive, systems with recapture will most likely be necessary to meet court decisions on wealth neutrality.

[8] The DPE grant allows districts to command revenue for education as if they had the tax base of the key district. The locally raised revenue of the i^{th} district is t_iW_i. Combining these revenues with the state grant of $t_i(W_k - W_i)$, the i^{th} district has at its disposal the amount t_iW_k. Thus, the i^{th} district can command revenues as if it had the tax base of the key district. Under DPE the size of the grant depends on the tax rate levied by the local district. Thus, if a poor district chooses to tax at a higher rate than a rich district, it will command more revenue per student.

The portion of local expenditures financed by the state is given by the state aid ratio (SAR) where

$$(2) \qquad SAR = 1 - \frac{\text{wealth per student of the } i^{th} \text{ district}}{\text{wealth per student of the key district}}$$

$$= 1 - \frac{W_i}{W_k}$$

Equation (2) shows that a district which is half as wealthy as the key district will have half of its total educational expenditures paid for by the state.[9]

Because under the DPE plan the state pays a portion of a district's budget, the plan affects the price of educational expenditure. To the key district which receives no state aid, $1 of education costs $1. However, a district half as rich as the key district has half of its budget paid for by the state and, thus, faces a price of $.50 for a dollar's worth of educational expenditure. The price (P) of education to the i^{th} district can be expressed as follows.

$$(3) \qquad P_i = 1 - SAR_i$$

Substituting equation (2) into equation (3), it follows that

$$(4) \qquad P_i = \frac{\text{wealth per student of the } i^{th} \text{ district}}{\text{wealth per student of the key district}} = \frac{W_i}{W_k}$$

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[9] Equation (2) is easily derived from equation (1).

$$(i) \qquad G_i = t_iW_k - t_iW_i$$

DPE assures that the total budget of the i^{th} district will be equal to t_iW_i. SAR is defined as G_i/t_iW_k. Dividing both sides of (i) by t_iW_k yields

$$(ii) \qquad \frac{G_i}{t_iW_k} = 1 - \frac{W_i}{W_i}$$

Thus, under the DPE plan a district that is 1% poorer than the key district faces a 1% lower price for its expenditures on education.

As long as education can be considered a normal economic good, we can expect that a lowering of its price will induce an increase in the quantity demanded on the part of a school district. The percentage change in expenditure per student caused by a percentage change in price is called the price elasticity of expenditure (β) and is a behavioral parameter the value of which must be estimated if we are to fully understand the potential effects of the DPE plan.

$$(5) \qquad \frac{\frac{\Delta E}{E}}{\frac{\Delta P}{P}} = \beta, \ (\beta < 0),$$

where E represents school district expenditure per student.

Education expenditures are, of course, affected by a school district's wealth or fiscal capacity as well as by the price of education. In the absence of a state funding plan, wealthy districts can be expected to spend more than poor districts on education. The percentage change in expenditure per student caused by a percentage change in wealth is called the wealth elasticity of expenditure (α) and is another behavioral parameter the value of which we need to know in order to predict the potential effects of the DPE system.

$$(6) \qquad \frac{\frac{\Delta E}{E}}{\frac{\Delta W}{W}} = \alpha, \ (\alpha > 0)$$

To see how a DPE program affects the revenue raising capacity and spending propensities of school districts, consider a case in which there exists two districts, one, the key district, having a level of wealth equal to \$1,010 per student and the other, a poor district, having wealth of \$1,000 per student. Also assume that the two communities' preferences for education are identical and that the values of behavioral parameters are known to be $\alpha = 1$ and $\beta = -2$. As a final condition, assume that in the absence of any state funding scheme the key district would spend \$101 per student.[10]

Under DPE the price of education to the poor district would be 1% lower than that facing the key district. This occurs simply because the wealth per student in the poor district is 1% lower than that in the key district. Since $\beta = -2$, the 1% cut in the price of education to the poor district implies that its spending will be increased to a level 2% greater than it would have been in the absence of the DPE plan. However, the districts have a wealth elasticity (α) of 1. This means that the difference in expenditures between the two districts that is due to wealth alone is 1%.

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[10] It follows from the equal preferences assumption that if the poor district were as rich as the key district and faced the same price of education, it would spend the same amount per student as the key district.

When the price and wealth effects are combined, the very interesting result is that the poor district will spend 1% more per student than the key district. This follows because the poor district was spending 1% less than the key district before DPE and the DPE plan induced the poor district to increase its spending by 2%. Thus, under the conditions assumed, DPE appears to have had a perverse effect. The poor district has been induced to spend more per student than the key district so that the wealth bias that DPE was intended to eliminate has been reversed rather than eliminated. In summary then, given the values of α and β, the DPE plan has produced a situation in which two districts that have the same preference for education are induced to spend differing amounts per student and thus, it has not achieved expenditure equity.

DPE and Taxpayer Equity.

Not only does DPE, in general, fail to produce expenditure equity, it also does not guarantee that taxpayer equity will be achieved. In our case, the key district locally raises and spends $101 per student on a tax base of $1,010 per student. Thus, the tax rate levied by the key district is 10%. The poor district will spend $102 per student. This district, which has a tax base of $1,000 per student, however, needs to raise only 99% of its educational expenditures locally. Thus, the tax rate levied by the poor district is 10.10%. By lowering the price of education to the poor district, the DPE plan has in this case induced the poor district to tax itself at a higher rate than the key district.[11]

In general, the amount of expenditure that a district will undertake depends on its wealth, its preference for education and the price of education. Given this level of expenditure and the state-aid ratio, the amount of funds which must be raised locally can be determined. The local tax rate can be calculated by dividing the required locally raised funds by the district's tax base. The important point is that the tax rate that a district levies depends both on its preference for education and the state subsidy scheme in effect. The DPE plan cannot guarantee expenditure equity because it ignores the fact that a district's tax rate is determined both by its preference for education and by its response to the price change incorporated in the subsidy plan. As will become apparent below, the DPE subsidy plan overstimulates poor districts when $|\alpha| < |\beta|$ and understimulates them when $|\alpha| > |\beta|$. The only case in which DPE will actually produce expenditure equity is when $|\alpha| = |\beta|$.[12]

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[11] Given the 1% lower price that the poor district faces for educational expenditure and given that the price elasticity of expenditure is -2, the poor district spends 1% more per student than the rich district. But the only way that a district that 1% poorer than another can spend 1% more when it faces a 1% lower price is by taxing itself at a 1% higher tax rate. This can be seen by considering the formula that relates the i^{th} district's tax rate (t_i) to its level of wealth per student (W_i), price (P_i) and expenditure per student (E_i).

$$\text{(i)} \qquad \frac{P_i \cdot E_i}{W_i} = t_i$$

The above equation follows directly from a district's local revenue identity which is

$$\text{(ii)} \qquad E_i P_i = W_i t_i$$

This identity simply says that the local portion ($E_i P_i$) of the school budget can be raised by taxing the local tax base (W_i) at the rate t_i.

[12] These results are derived in Feldstein, "Wealth Neutrality and Local Choice in Public Education", op. cit.

Table 1 summarizes the figures used in our arithmetic example. Assuming $\alpha = 1$ and $\beta = -2$, the poor district taxes itself at a higher tax rate than the key district even though they have the same preference for education. The treatment of taxpayers implicit in the DPE plan can be determined by considering the elasticity of the tax rate with respect to wealth (ξ_{tW}^{DPE}). The elasticity of the tax rate with respect to wealth tells us the percentage change in the tax rate per 1% change in wealth that will occur under the DPE plan. For DPE, $\xi_{tW}^{DPE} = \alpha + \beta$.[13] Thus, in a DPE

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[13] The elasticity of t with respect to W is

$$\text{(i)} \qquad \xi_{tW}^{DPE} = \frac{W}{t}\frac{dt}{dW}$$

The tax rate faced by a district is given by

$$\text{(ii)} \qquad t_i = \frac{P_i(E_i)}{W_i}$$

The price formula under DPE is

$$\text{(iii)} \qquad P_i = kW_i$$

Assuming a Cobb-Douglas (multiplicative) specification for the educational expenditure function and ignoring all independent variables other than wealth and price (since as wealth changes only price is changed by the subsidy formula), we have

$$\text{(iv)} \qquad E_i = W_i^{\alpha} \cdot P_i^{\beta}$$

Substituting (iii) and (iv) into (ii), we have

$$\text{(v)} \qquad t = \frac{kW_i(W_i^{\alpha} \cdot (kW_i)^{\beta})}{W_i} = k^{1+\beta} \cdot W_i^{\alpha+\beta}$$

$$\text{(vi)} \qquad \frac{dt}{dW_i} = k^{1+\beta}(\alpha+\beta)W_i^{\alpha+\beta-1}$$

Thus,

$$\xi_{tW}^{DPE} = \frac{W_i}{k^{1+\beta}\ W_i^{\alpha+\beta}} \quad k^{1+\beta}(\alpha+\beta)W_i^{\alpha+\beta-1} = \alpha+\beta$$

system, with $\alpha = 1$ and $\beta = -2$, a 1% rise in wealth causes the tax rate to fall by 1%.

What then does DPE achieve? Table 1 shows that effort equity is achieved under DPE. Our definition of effort equity requires that for the i^{th} and key districts expenditure per student per 1% of tax rate is identical for the two districts. That is,

$$(7) \qquad \frac{E_i}{t_i} = \frac{E_k}{t_k}$$

Expenditure per student in the poor district is 1% greater than that in the key district but the tax rate is also 1% higher in the poor district.[14]

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[14] To see that effort equity will always be achieved under DPE, examine formulas (i) and (ii) which relate a district's tax rate (t_i) to its wealth per student (W_i), net price (P_i), and the level of expenditure per student (E_i).

$$(i) \qquad \frac{P_i E_i}{W_i} = t_i$$

Simple rearrangement yields

$$(ii) \qquad \frac{E_i}{t_i} = \frac{W_i}{P_i}$$

Since a district that is 1% wealthier than another faces a 1% higher price of education expenditure under DPE, it must be true that E_i/t_i is independent of the district's level of wealth (and is also independent of the values of α and β). Thus, although DPE fails to guarantee expenditure equity, it always achieves effort equity.

TABLE 1

Fiscal Characteristics Under the DPE System

DPE with $\alpha = 1$, $\beta = -2$

	(1) W_i	(2) P_i	(3) E_i	(4) $ Raised Locally	(5) t_i	(6) $\frac{E_i}{t_i}$
Poor District	$1,000	$ .99	$102	$101	10.10%	$10.10
Key District	$1,010	$1.00	$101	$101	10.00%	$10.10

Col. (4) = Col. (2) x Col. (3)

$$\text{Col. (5)} = \frac{\text{Col. (4)}}{\text{Col. (1)}}$$

$$\text{Col. (6)} = \frac{\text{Col. (3)}}{\text{Col. (5)}}$$

It should now be apparent that DPE can guarantee neither expenditure equity nor taxpayer equity. Two districts may have the same preference for education. However, when $|\beta| > |\alpha|$, DPE gives the poor district a lower price than is needed to offset the difference in expenditure due to the wealth differential. Thus, the poor district is induced to spend more per student than the wealthy district, a state of affairs which can only be reached if the poor district uses a higher tax rate than that employed in the key district. Although residents of the poor district are not burdened in the sense of effort equity, they are burdened in another way since they face a higher tax rate than would exist based on their preference for education alone.

IV
THE WEALTH NEUTRAL SYSTEM (WNS)

Martin Feldstein has devised an allocation formula with which the effect of differences in school district wealth on educational expenditure per student can be neutralized.[15] Under this system, referred to as WNS, two school districts with the same preference for education but different levels of wealth will be induced to spend the same amount per student.

Wealth neutrality is achieved by taking explicit account of a district's price and wealth elasticities in determining its state financed grant. If the value of the relevant behavioral parameters (α and β) are known, it is possible (through a system of matching grants) to change the price of educational expenditure just enough to offset the effect of wealth differences on educational expenditure per student. That is, a price of education for a poor district can be set just low enough to induce it to increase education expenditure per student by an amount which just equals the negative expenditure differential due to wealth.

Since the manipulation of the price variable offsets only wealth differentials, WNS still allows two districts with different preferences for education to spend different amounts per student. Thus, the WNS approach neutralizes wealth as a factor affecting educational expenditure while preserving local choice.

The ability of WNS to achieve expenditure equity can be illustrated with a simple numerical example. Once again assume there exists a poor district whose wealth per student is $1,000 and a key district with wealth per student of $1,010. Also assume that $\alpha = 1$ and $\beta = -2$, and that in the absence of a state funding scheme the key district would spend $101 per student and that the poor district would spend $100.[16]

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[15] Martin S. Feldstein, Ibid.

[16] Given its wealth elasticity, if the poor district were 1% wealthier, it would spend 1% more on education (i.e. $101 per student). Since the price of a dollar's worth of school expenditure would be $1 for each district in the absence of state intervention, it can be inferred that in the above case both districts have the same preference for education.

The crucial element in the WNS approach is equation (8) which is used to determine the price of education that a school district must face to achieve expenditure equity.[17]

$$P_i = kW_i^{-\frac{\alpha}{\beta}} \tag{8}$$

where P_i = the price that the i^{th} district pays per dollar of educational expenditure.

W_i = the i^{th} district's wealth per student.

k = constant scale factor.

The value of k is set such that the price to the key district will be \$1. With $\alpha = 1$, $\beta = -2$, and the per student wealth of the key district being \$1,010, the value of k that will set P = \$1 is ,031465839.

$$\boxed{\begin{array}{c} \$1 = k(1010)^{\frac{1}{2}} \\ k = .31465839 \end{array}}$$

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[17] Assume that expenditure per student depends on a district's wealth (W), the price it faces (P) and other factors (Z) which reflect a district's preference for education. Thus, a simplified version of the regression equation might be (in log form)

$$\ln E = a + \alpha \ln W + \beta \ln P + \gamma \ln Z + u$$

To see that the price equation (8) neutralizes the effect of wealth on expenditure per student, equation (8) is expressed in log form and substituted into the above regression equation.

$$\ln P = \ln k - \frac{\alpha}{\beta} \ln W$$

Substituting, we have

$$\ln E = a + \alpha \ln W + \beta(\ln k - \frac{\alpha}{\beta} \ln W) + \gamma \ln Z + u$$

$$\ln E = a + \alpha \ln W + \beta \ln k - \alpha \ln W + \gamma \ln Z + u$$

$$\ln E = a + \beta \ln k + \gamma \ln Z + u$$

Since the wealth variable does not appear in the final equation, expenditure per student is independent of wealth under WNS.

The price of education to the poor district will, of course, be less than \$1 and the exact value can be calculated using equation (8). When $W = \$1,000$, $P = .995$,

$$\boxed{\begin{array}{l} P = (.31465839)\ (1,000)^{\frac{1}{2}} \\ P = .995 \end{array}}$$

The price faced by the poor district is 1/2% less than the price faced by the key district.[18] Given its price elasticity of educational expenditure, this district will be induced to spend 1% more on education than it would have without the state matching grant. Since it spent 1% less than the key district before the state subsidy, the effect of the grant is to induce this district to spend at the same level as the key district. That is, the combined effect of the price and wealth elasticities act to assure that in both districts the level of expenditure is \$101 per student. Thus, the manipulation of the price variable has neutralized wealth as a factor in determining the level of expenditure per student.

WNS and Taxpayer Equity.

Is the WNS approach capable of achieving taxpayer equity as well as expenditure equity? To spend \$101 per student, the key district taxes its residents at a rate of 10%. The poor district, however, does not bear the full burden of its expenditures; it is subsidized by the state. The poor district faces a price of education which is 1/2% below that faced by the key district. Therefore, the district must locally raise only 99.5% of its expenditure per student ($101 · 99.5% = $100.50). But in order to raise $100.50 per student from a tax base of $1,000 per student it must tax its residents at a rate of 10.05%. That is, although preferences for education are uniform between the two districts, the residents of the poor district face a higher tax rate than those of the wealthy district. Thus, although the WNS guarantees expenditure equity, it does not necessarily result in taxpayer equity.[19] Table 2 summarizes these results.

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[18] To achieve wealth neutrality, WNS gives districts a $(-\frac{\alpha}{\beta})\%$ change in price for each 1% difference in wealth. For example, if $\alpha = 1$ and $\beta = -3$, a district would be three times as responsive to price effects than to wealth effects. If a district were 1% poorer than the key district, it would need only a 1/3% lower price for it to have the same level of expenditure per student. Thus, when $\alpha = 1$ and $\beta = -3$, the WNS calls for a 1/3%, i.e. $(-\frac{\alpha}{\beta})\%$ price differential for every 1% difference in wealth.

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[19] Given its 1/2% price reduction, the poor district can spend $101 per student by raising $100.50 locally. But to raise locally 1/2% less revenue than a district with a 1% larger base, it must tax at a rate that is 1/2% higher than that of the wealthier district. The truth of this statement can be seen by considering the formula,

$$\frac{P_i E_i}{W_i} = t_i \cdot$$

TABLE 2

Fiscal Characteristics Under WNS With $\alpha = 1$, $\beta = -2$

District	(1) W_i	(2) P_i	(3) E_i	(4) \$ Raised Locally	(5) t_i	(6) $\frac{E_i}{t_i}$
Poor District	\$1,000	\$ .995	\$101	\$100.50	10.05%	\$10.05
Key District	\$1,010	\$1.00	\$101	\$101.00	10.0%	\$10.10

Col. (4) = Col. (2) x Col. (3)

$$\text{Col. (5)} = \frac{\text{Col. (4)}}{\text{Col. (1)}}$$

$$\text{Col. (6)} = \frac{\text{Col. (3)}}{\text{Col. (5)}}$$

The treatment of taxpayers implicit in WNS can be determined by considering the elasticity of the tax rate with respect to wealth ξ_{tW}^{WNS}. As in the case of DPE, the result depends on the values of α and β, but under WNS

$$\xi_{tW}^{WNS} = (-\frac{\alpha}{\beta} - 1)$$

With $\alpha = 1$ and $\beta = -2$, the tax rate falls by 1/2% for every 1% increase in wealth.[20]

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[20] The elasticity of t with respect to W is

$$\text{(i)} \qquad \xi_{tW}^{WNS} = \frac{W}{t}\frac{dt}{dW}$$

The tax rate faced by a district is given by

$$\text{(ii)} \qquad t_i = \frac{P_i(E_i)}{W_i}$$

The price formula under WNS is

$$\text{(iii)} \qquad P = kW_i^{-\frac{\alpha}{\beta}}$$

Expenditure per student is

$$\text{(iv)} \qquad E_i = W_i^{\alpha} \cdot P_i^{\beta} = W_i^{\alpha} \cdot \left(kW_i^{-\frac{\alpha}{\beta}}\right)^{\beta} = k^{\beta}$$

Substituting (iii) and (iv) into (ii) we have

$$\text{(v)} \qquad t = \frac{kW_i^{-\frac{\alpha}{\beta}}(k^{\beta})}{W_i} = k^{1+\beta} \quad W_i^{-\frac{\alpha}{\beta} - 1}$$

Taking the derivative of (v) with respect to wealth, we have

$$\frac{dt}{dW_i} = k^{1+\beta} \, (-\frac{\alpha}{\beta} - 1) \; W_i^{-\frac{\alpha}{\beta} - 2}$$

Thus

$$\xi_{tW}^{WNS} = \frac{W_i}{k^{1+\beta}\left(W_i^{-\frac{\alpha}{\beta} - 1}\right)} \; k^{1+\beta}(-\frac{\alpha}{\beta} - 1) \; W_i^{-\frac{\alpha}{\beta} - 2} = -\frac{\alpha}{\beta} - 1$$

There is a special case in which the WNS achieves both expenditure and taxpayer equity. Equation (9) expresses the relation between a district's tax rate, price, wealth per student and level of expenditure per student.

$$t_i = \frac{P_i E_i}{W_i} \tag{9}$$

Since WNS guarantees that two districts with the same preference for education will have the same expenditure per student, equation (9) shows the two districts will face the same tax rate only if the percentage wealth differential is equal to the percentage price differential. But the only case in which the achievement of expenditure equity calls for a 1% price differential for every 1% difference in wealth is when $|\alpha| = |\beta|$.[21]

Will effort equity be achieved under WNS? We refer back to Table 2. Although, under WNS, expenditure per student is equated for the two districts, column (6) shows that expenditure per student per 1% of tax rate is 1/2% less in the poor district than in the key district. This follows since both districts have the same expenditure per student, but the poor district faces a 1/2% higher tax rate than the key district.

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[21] This proposition may be put another way. For expenditure equity to exist, the percentage wealth differential times the wealth elasticity must equal the percentage price differential times the price elasticity. For taxpayer equity to exist (given the same expenditure per student), the percentage wealth differential must equal the percentage price differential. Only if the wealth elasticity is equal to the price elasticity do we achieve both expenditure and taxpayer equity.

WNS will always give poorer districts less expenditure per student per 1% of tax rate whenever $|\alpha| < |\beta|$. Equation (10) should help make this statement clear.

$$\frac{E_i}{t_i} = \frac{W_i}{P_i} \tag{10}$$

In this case, the percentage difference in price is less than the percentage difference in wealth, thus expenditure per student per 1% of tax rate rises as a function of wealth. Of course, if $|\alpha| > |\beta|$, WNS gives poorer districts more expenditure per student per 1% of tax rate than wealthy districts.

Summary.

Whether or not state funding schemes such as DPE or WNS can achieve either expenditure or taxpayer equity depends on the values of the behavioral parameters α and β, the wealth and price elasticities of educational expenditure When $\alpha \neq \beta$, a DPE system will achieve neither expenditure nor taxpayer equity. DPE provides a 1% price difference for every 1% difference in wealth. But if $|\beta| > |\alpha|$ poor districts (with the same preference for education as wealthy districts) will be induced to spend more per student than the wealthy districts. Moreover, since the expenditure per student of the two districts will not be the same, the fact that the percentage price differential is equal to the percentage wealth differential guarantees that the tax rates levied by the two districts will not be the same.

DPE does result in what we have called effort equity. Since between two districts, DPE adjusts prices by 1% for every 1% difference in wealth, expenditure per student per 1% of tax rate is constant under DPE.

WNS achieves expenditure equity. In this system, expenditure per student is made wealth neutral by setting the price of education to local districts at just the level needed to offset expenditure differences caused by wealth differences among districts. WNS does not, in general, result in either taxpayer equity or effort equity.

If $|\alpha| = |\beta|$, both DPE and WNS satisfy expenditure equity, taxpayer equity and effort equity. When $|\alpha| = |\beta|$, the pricing scheme that produces wealth neutrality (equation (8)) is equivalent to the price formula implicit in DPE (equation (4)). Thus, under this condition, DPE may be viewed as a special case of WNS and either funding approach will result in expenditure equity. That is, districts with the same preference for education will spend the same amount per student. With $|\alpha| = |\beta|$, the price of education to each district changes 1% for every 1% difference in wealth. Equation (9) shows that the tax rate needed to finance educational expenditures will be the same in each district. This means that taxpayer equity is achieved. Effort equity will also be achieved by both plans when $|\alpha| = |\beta|$. This must be true because when $|\alpha| = |\beta|$, DPE and WNS produce identical effects and it has already been demonstrated that DPE results in effort equity. Table 3 presents the numerical results when $\alpha = 1$, $\beta = -1$.

TABLE 3

Fiscal Characteristics under WNS = DPE
When α = 1, β = -1, k = .031465839

District	(1) W_i	(2) P_i	(3) E_i	(4) $ Raised Locally	(5) t_i	(6) $\frac{E_i}{t_i}$
Poor District	$1,000	$ .99	$101	$100	10%	$10.10
Key District	$1,010	$1.00	$101	$101	10%	$10.10

Col. (4) = Col. (2) x Col. (3)

$$\text{Col. (5)} = \frac{\text{Col. (4)}}{\text{Col. (1)}}$$

$$\text{Col. (6)} = \frac{\text{Col. (3)}}{\text{Col. (5)}}$$

V.

EMPIRICAL ANALYSIS

We have two main goals in this section. We wish to:

(1) estimate statistically the values of the behavioral parameters α and β for Pennsylvania school districts.

(2) simulate the patterns of per student expenditure and local property tax rates across Pennsylvania school districts that would be produced under various types of DPE and WNS funding systems.

Three sets of simulations are presented. The first set shows the distribution of expenditure per student and tax rates under both DPE and WNS when the median wealth district is chosen as the key district. The second set shows the expenditure and tax patterns likely to emerge when the average level of simulated expenditure is constrained to equal the average level of actual expenditure in Pennsylvania in 1976 ($1,044 per student). A third set of simulations takes account of the property mix (the proportion of the property value owned by residents vs. nonresidents) in determining the patterns of expenditure per student and tax rates under both DPE and WNS.

Estimating the Values of α and β.

Regression analysis is used to derive our empirical estimates of α and β (the wealth and price elasticities of educational expenditure). In our statistical procedure we regress expenditure per student on eight independent variables. We have expressed the equations in natural logs. In this form the estimated coefficients of the regression equation can be interpreted as elasticity values. Our calculations are based on data from all 505 school districts in Pennsylvania and all observations, except those that represent lagged values of the dependent variable, are for 1976.[22] The dependent and eight independent variables are listed below.

DEPENDENT VARIABLE: School district general fund expenditure per weighted average daily membership (E).

INDEPENDENT VARIABLES:

(1) School district personal income per weighted average daily membership (INC).

(2) Market value of property per weighted average daily membership (W).

(3) Price of education (P) = the dollar price to the district of one dollar of expenditure.

(4) Federal non-matching grants (FED).

(5) State block (non-matching) grants (SBG).

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[22] The data used in the regression analysis were provided by the Division of Education Statistics, Bureau of Information Systems, Pennsylvania Department of Education.

(6) Ratio of the current weighted average daily membership to the weighted average daily membership five years ago (WADM).

(7) Percentage of students in the population (PERC).

(8) Expenditure per weighted average daily membership lagged two years (LAGVAR).

The most important variable to describe in detail is the price of education. Since both the DPE and WNS subsidy plans are matching grant systems which alter the price of education to districts, our empirical goal is to measure districts' responsiveness to the matching grant component of the state-aid program. The current Pennsylvania State educational financial plan is a complex system composed of both matching grants and state block grants to local school districts.[23] Under Pennsylvania's Act 59 program, a local school district is entitled to matching aid if it satisfies two criteria

(i) the level of expenditure per student in the district is less than the median level of school district expenditure per student.

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[23] The state subsidy given to a district depends on the number of students, local wealth, per student cost of education, density, sparsity and poverty factors. The system is described in the Act 59 Subsidy Primer, published by the Pennsylvania Department of Education.

(ii) the school district demonstrates that it is making an appropriate tax effort.[24]

For districts that satisfy both criteria, each dollar of local expenditure triggers a state grant of an amount equal to $1 times the aid ratio that pertains to that district. The district's aid ratio depends upon both its wealth per student and income per student.[25] In general, under the Pennsylvania subsidy plan, the price of education to the i^{th} district may be expressed as follows.[26]

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[24] Tax effort is measured by the equalized millage rate. The base earned for reimbursement depends on a district's millage rate relative to the median millage rate. The "Base Earned for Reimbursement" is determined as the smaller of either:

(a) The district's actual instructional expense for weighted average daily membership;

or

(b) The amount earned through tax effort, calculated as follows:

1. Where the district's equalized millage is 30% or more above the State's Median Equalized Millage, the base earned shall be the state's median actual expense per statewide weighted average daily membership.
2. Where the district's equalized millage is 15%, but less than 30% above, the amount shall be $50 less.
3. Where the district's equalized millage is less than 15% below, the amount shall be $100 less.
4. Where the district's equalized millage is 15% to 30% below, the amount shall be $150 less.
5. Where the district's equalized millage is more than 30% below, the amount shall be $200 less.

[25] The aid ratio is a weighted average of the market value aid ratio and the personal income aid ratio. The market value aid ratio is derived by dividing the value of taxable property per weighted student in a district by the taxable property per weighted student for the state as a whole. The personal income aid ratio is the personal income per weighted student in a district divided by taxable income per weighted student for the state as a whole. The relative weights of the combined aid ratio are property value 60%, income 40%.

$$P_i = \frac{1}{1 + (\text{aid ratio})_i} \tag{11}$$

For districts not qualifying for matching aid, the price of an additional dollar of educational expenditure is $1. For districts that face a price of $1, state aid under Act 59 comes in the form of block grants. The influence of this factor on expenditures per student was captured in our regression equation through the state block grant variable.

The estimated regression equation is reported below. The numbers in parentheses are the absolute values of the t-statistics.

$$\begin{aligned} \ln E = {} & \underset{(2.524)}{.62136} + \underset{(10.53)}{.1349 \ln W} + \underset{(5.40)}{.0737 \ln INC} - \underset{(5.30)}{.9333 \ln P} \\ & + \underset{(21.80)}{.5351 \ln LAGVAR} - \underset{(6.05)}{.0834 \ln SBG} - \underset{(1.31)}{.021 \ln PERC} \\ & - \underset{(1.88)}{.011 \ln FED} + \underset{(7.21)}{.2461 \ln WADM} \end{aligned} \tag{12}$$

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[26] For example, if a district has an aid ratio of .5 and it spends an additional dollar on education, the state will provide a grant of $.50, resulting in a total expenditure of $1.50. In this case, the local district pays 2/3 of the cost, the state pays 1/3, and the price of a dollar's worth of education to this district is $.6667. Equation (11) differs from the price formula of equation (3). Equation (3) assumes that the state pays a portion (SAR) of each $1 that is spent. Equation (11) assumes that state aid ($1 · aid ratio) is added to each $1 that the district spends. As the numerical example of this footnote makes clear, an aid ratio of .5 in equation (11) corresponds to an SAR of .33 in equation (3).

According to equation (12), the estimated value of $\alpha = .13491$ and $\beta = -.9333$.[27] Apparently districts are approximately seven times as responsive to price as they are to wealth.

Simulations of the Patterns of Expenditure per Student and Tax Rates Among Pennsylvania School Districts.

Here we simulate the patterns of expenditure per student and local property tax rates that would emerge across school districts in Pennsylvania under various types of DPE and WNS funding systems. The discussion is divided into three parts. In part I we explain the mechanics used to generate the simulation and we describe the expenditure and tax patterns that result when the district with median wealth is selected as the key district. In part 2 we simulate the patterns likely to emerge where the average level of simulated expenditure is constrained to equal the average level of actual expenditure in Pennsylvania in 1976. Part 3 provides a set of simulations intended to demonstrate the impact of the local property mix on inter-district expenditure and tax patterns.

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[27] Our estimates should be interpreted with caution since 1976 is the first year's data upon which Act 59 subsidies are based. Unfortunately, data constraints necessitated the use of 1976 data. Clearly, it would be worthwhile to estimate these elasticities once the Act 59 subsidy system has been in effect for several years. However, it should be noted that these estimates are of the same general magnitude as those estimated by Feldstein for Massachusetts school districts. His estimates were: $\alpha = .283$, $\beta = -1.00$. See Feldstein, op. cit., pg. 82.

Part 1

Expenditure and Tax Rate Simulations When the District with Median Wealth Is the Key District

The procedure used for simulating expenditures and local tax rates involves three steps.

(1) Select the key district and set the price of education to be faced by each district.

(2) Calculate the level of expenditure per student in a school district by inserting the price of education to the district (determined in (1) above) and the district's values of the other independent variables into our regression equation.

(3) Calculate the local tax rate needed to finance the local share of the school budget.

The first step is to determine the price of a dollar's worth of education faced by each district. Under DPE the price of education is entirely dependent on the wealth of the district. A district that is 1% poorer than another faces a 1% lower price of education. The price of education implicit in the DPE plan is

$$P_i = kW_i \quad .$$

Under the WNS plan, the price that a district faces depends on the value of α and β, as well as upon the district's level of wealth. As explained in section IV above, the formula for determing the price of education to a school district under WNS is

$$P_i = kW_i^{-\alpha/\beta}$$

In order to calculate the WNS price of education to a district of a given amount of wealth, we need to know the values of α, β and k. Based on our regression analysis, the estimated wealth elasticity of expenditure per student (α) is .1349 and the estimated price elasticity of expenditure per student (β) is -.9333. The value selected for k is that which makes the price of education to the key district equal to $1.[28]

Tables 4 and 5 contain two sets of simulations. The entries in Table 4 describe the expenditure and tax rate patterns we expect to emerge under a DPE plan. Those shown in Table 5 would be expected under WNS. We did not feel it necessary to provide simulations for all 505 Pennsylvania school districts. Instead, we limited our calculation to 21 sample districts, one for each 5th percentile in terms of wealth per student.

The price of education to districts of various levels of wealth are presented in column (2) of each table. In these simulations the district of median wealth has been selected as the key district. In both cases the median is Bentworth School District (11th on the list), and faces a price of $1. Notice that the range of values between the price to the poorest and richest district is much less under WNS than under DPE. This occurs because DPE provides a 1% difference in price for each 1% difference in wealth, whereas the WNS plan gives only a 1/7% difference in price for a 1% difference in wealth.[29]

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[28] This calculation was described on p. 17.

Our second step is to simulate the level of expenditure per student for each district. This is accomplished by inserting the values of the independent variables that pertain to the district (including the price that it faces under the particular subsidy plan) into regression equation (13).[30]

$$
\begin{aligned}
(13) \qquad \ln E = {} & .62136 + .1349 \ln W + .0737 \ln INC - .9333 \ln P \\
& + .5352 \ln LAGVAR - .021 \ln PERC - .01 \ln FED \\
& + .246 \ln WADM
\end{aligned}
$$

Column (3) of Table 4 shows the simulated expenditures per student across Pennsylvania school districts under a DPE system. The pattern that emerges is that expenditures per student decline as a function of wealth. This result occurs because of the interaction of two factors. First, since DPE gives a 1% change in price for each 1% difference in

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[29] It should be remembered that the price formula in the WNS plan takes account of the fact that $\alpha = .13491$ and $\beta = -.9333$. Since districts are approximately seven times more responsive to price than to wealth, WNS gives only a 1/7% difference in price for each 1% difference in wealth.

[30] In our simulations of the patterns of expenditure per student under both DPE and WNS, we have set the state block grant variable for each district equal to zero. Since we are interested in the patterns that would emerge under a pure matching rate system (either DPE or WNS), we felt that the inclusion of state block grant variable would have produced distorted patterns of expenditure.

Table 4

Simulations of Educational Expenditure per Student and Imputed Property Tax Rates Across Pennsylvania School Districts Under a System of District Power Equalization in which the Median Wealth District is the Key District[1]

(1) District Wealth per Student ($)	(2) Price ($)	(3) Expenditure per Student ($)	(4) Property Tax Rate (%)	(5) Expenditure per Student ($)	(6) Property Tax Rate (%)
7,510	.35222	1,157.7	.054	1,437.9	.067
11,380	.53372	867.8	.041	1,031.8	.048
13,240	.62096	801.7	.038	914.3	.043
14,430	.67677	698.1	.033	853.6	.040
15,455	.72484	704.9	.033	808.1	.038
16,431	.77061	709.3	.033	769.5	.036
17,326	.81259	703.2	.033	737.6	.035
18,023	.84528	689.4	.032	714.7	.034
19,317	.90598	609.0	.029	676.3	.032
20,175	.94621	600.5	.028	653.2	.031
21,329	1.00033	624.8	.029	624.8	.029
22,274	1.04465	564.9	.026	603.6	.028
23,724	1.11266	571.1	.027	573.9	.027
25,133	1.17874	546.8	.026	548.1	.026
26,581	1.24665	513.1	.024	524.1	.025
28,598	1.34125	587.3	.028	494.4	.023
30,699	1.43978	513.5	.024	467.2	.022
33,100	1.55239	484.4	.023	439.9	.021
36,499	1.71180	444.9	.021	406.9	.019
45,699	2.14328	361.8	.017	340.0	.016
90,260	4.23319	213.8	.010	197.5	.009

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[1] Source: All numbers are derived from data made available by the Division of Education Statistics, Pennsylvania Department of Education.

Table 5

Simulations of Educational Expenditure per Student and Imputed Property Tax Rates Across Pennsylvania School Districts Under a Wealth Neutral System in Which Median Wealth District is the Key District[1]

(1) District Wealth per Student ($)	(2) Price ($)	(3) Expenditure per Student ($)	(4) Property Tax Rate (%)	(5) Expenditure per Student ($)	(6) Property Tax Rate (%)
7,510	.85993	503.2	.058	625.0	.072
11,380	.91318	525.6	.042	625.0	.050
13,240	.93339	548.0	.039	625.0	.044
14,430	.94508	511.1	.033	625.0	.041
15,455	.95450	545.2	.034	625.0	.039
16,431	.96299	576.1	.034	625.0	.037
17,326	.97040	595.8	.033	625.0	.035
18,023	.97595	602.8	.033	625.0	.034
19,317	.98578	562.8	.029	625.0	.032
20,175	.99199	574.6	.028	625.0	.031
21,329	1.00000	625.0	.029	625.0	.029
22,274	1.00629	585.0	.026	625.0	.028
23,724	1.01551	621.9	.027	625.0	.027
25,133	1.02401	623.5	.025	625.0	.025
26,581	1.03234	611.9	.024	625.0	.024
28,598	1.04331	742.4	.027	625.0	.023
30,699	1.05406	687.1	.024	625.0	.021
33,100	1.06560	688.2	.022	625.0	.020
36,499	1.08076	683.4	.020	625.0	.019
45,699	1.11646	665.0	.016	625.0	.015
90,260	1,23191	676.8	.009	625.0	.009

[1] Source: All numbers are derived from data made available by the Division of Education Statistics, Pennsylvania Department of Education.

wealth, the range of values of the price of education is quite wide between the richest and poorest districts. The other factor is the very high magnitude of the price elasticity in relation to the wealth elasticity of expenditure. That is, low prices induce very large expenditure responses. The remarkable result displayed in this table is that the poorest district has been induced to spend more than five times the amount being spent by the richest district.

A second set of simulations is also presented in Table 4. Column (5) shows the projected pattern of expenditures for Pennsylvania under a DPE system if districts were identical in all respects other than wealth. This accomplished by assuming that with the exception of price and wealth the values of the independent variables for each district are the same as those of the median district. These median district values are then used in the regression equation to produce the simulated levels of expenditure. This allows us to isolate the effects of DPE on the patterns of expenditures. The resulting pattern is even more dramatic than that shown in column (3). In this case expenditure per student in the poorest district is more than seven times as great as the richest district.

The ability of WNS to achieve wealth neutrality is demonstrated in Table 5. Column (3) shows the resulting pattern of expenditure per student when we use the value of each district's independent variables in the regression equation. Column (3) shows a slight positive relationship between expenditure per student and the level of district wealth. Since WNS neutralizes wealth, this pattern must be due to the effect of the other independent variables.

The pattern of expenditure revealed in column (5) of Table 5 provides the clearest picture of the effect of WNS. In this simulation districts are assumed to be identical in all respects other than wealth. That is, in using the regression equation to derive the level of expenditure we use each district's own value of wealth per student and its own price under WNS, but the values of the other independent variables are those of the median district. The result is that the level of expenditure per student is the same everywhere. Wealth neutrality with respect to per student educational expenditures is clearly visible.

The third and final step in our procedure is to determine the local tax rate needed to finance the projected level of expenditure per student. The local tax rate is simply the amount of revenue per student that the district must raise divided by the market value of property per student for the district. The amount the local district must raise is calculated by multiplying the level of expenditure per student by the price of education faced by the district.

Columns (4) and (6) of Table 4 show that under the assumed DPE plan the local tax rate declines with increasing levels of district wealth. This result is not caused by differences in districts' tax bases since under DPE each district is guaranteed that for any given tax rate it can raise the same amount of revenue per student as the key district. The decline in tax rates occurs because poor districts have been induced to spend more than rich districts on education. Poor districts spend more on education because they are given a 1% difference in price for every 1% difference in wealth, even though districts appear to be about seven times as responsive to price differences than to wealth differences.

Tax rates also decline as a function of wealth in our WNS simulations. Columns (4) and (6) of Table 5 show the steady downward drift in tax rates as the level of district wealth rises under WNS. In the case of DPE, tax rates were higher for poor districts because they had been induced to spend more than the richer districts on education. Under the WNS simulations, levels of expenditure per student do not decline as a function of wealth so that the source of the decline in tax rates cannot be the same for DPE and WNS.

The general relationship between the tax rates of school districts and their levels of wealth can be expressed using the concept of tax elasticity. In Section IV above it was shown that the elasticity of the tax rate with respect to wealth under the WNS plan is $(-\frac{\alpha}{\beta}-1)$. Thus, given our parameter estimates, the tax rate declines by approximately 6/7% for each 1% increase in wealth. Intuitively, WNS gives districts a price change which is just large enough to achieve wealth neutrality. For Pennsylvania, WNS gives districts a 1/7% change in price for each 1% difference in wealth. The equation below shows that, for given levels of expenditure, if price rises by a smaller percentage than wealth, the tax rate must fall as a function of wealth.

$$\frac{E_i P_i}{W_i} = t_i$$

Part 2

Expenditure and Tax Rate Simulations with Average Projected Expenditures Constrained to Equal Average Actual Expenditure per Student in Pennsylvania in 1976.

The state-wide average level of the simulated expenditures presented in Tables 4 and 5 are substantially below the actual amount spent by Pennsylvania districts during the year 1976. (The actual average level of expenditures per student was $1,044.) This occurs because we did not include the influence of state block grants in our simulated expenditures. Presumably, state block grants would not be needed in either a pure DPE or WNS system. Thus, to retain the SBG variable in the simulation procedure would produce distorted patterns of expenditures.[31]

Tables 6 and 7 show the patterns of expenditure per student and tax rates when state block grants are set equal to zero and the average level of expenditure per student for our 21 sample districts is constrained to equal $1,044. To assure that the average level of simulated expenditures will equal $1,044, a district which is wealthier than the median wealth district must be used as the key district. The selection of a wealthier district as the key district provides all districts with lower prices for education and thereby induces them to spend at higher levels.

Table 6 simulates the expenditures associated with our DPE plan. A mathematical search procedure revealed that in order to insure that the average level of expenditures across all Pennsylvania school districts

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[31] The SBG variable was included in the estimation of the behavioral parameters (α and β) in order to guarantee unbiased estimates of districts' responsiveness to wealth and price. Given these estimates, the simulations were carried out with SBG = 0.

Table 6

Simulations of Educational Expenditure per Student and Imputed Property Tax Rates Across Pennsylvania School Districts Under a System of District Power Equalization (Simulated Average Expenditure per Student Constrained to Equal $1,044)[1]

(1) District Wealth per Student ($)	(2) Price ($)	(3) Expenditure per Student ($)	(4) Property Tax Rate (%)	(5) Price ($)	(6) Expenditure per Student ($)	(7) Property Tax Rate (%)
7,510	.205759	1,912.1	.052	.262606	1,891.2	.066
11,380	.311789	1,433.2	.039	.397930	1,357.1	.047
13,240	.362750	1,324.1	.036	.462969	1,202.6	.042
14,430	.395353	1,152.9	.032	.504581	1,122.7	.039
15,455	.423436	1,164.2	.032	.540422	1,062.9	.037
16,431	.450177	1,171.6	.032	.574551	1,012.1	.035
17,326	.474698	1,161.4	.032	.605847	970.2	.034
18,023	.493794	1,138.6	.031	.630219	940.1	.033
19,317	.529247	1,005.8	.028	.675467	889.5	.031
20,175	.552755	991.8	.027	.705469	859.1	.030
21,329	.584372	1,031.9	.028	.745821	821.8	.029
22,274	.610263	933.0	.026	.778866	793.8	.028
23,724	.649990	943.2	.026	.829569	754.8	.026
25,133	.688594	903.1	.025	.878838	720.9	.025
26,581	.728267	847.5	.023	.929471	689.3	.024
28,598	.783528	969.9	.027	1.000000	650.2	.023
30,699	.841092	848.2	.023	1.073467	614.4	.021
33,100	.906874	800.0	.022	1.157424	578.6	.020
36,499	1.000000	734.7	.020	1.276278	535.1	.019
45,699	1.252062	597.5	.016	1.597979	447.2	.016
90,260	2.472944	353.2	.010	3.156165	259.7	.009

[1] Source: All numbers are derived from data made available by the Division of Education Statistics, Pennsylvania Department of Education.

Table 7

Simulations of Educational Expenditure per Student and Imputed Property Tax Rates Across Pennsylvania School Districts Under a Wealth Neutral System[1] (Simulated Average Expenditure per Student Constrained to Equal $1,044)[1]

(1) District Wealth per Student ($)	(2) Price ($)	(3) Expenditure per Student ($)	(4) Property Tax Rate (%)	(5) Price ($)	(6) Expenditure per Student ($)	(7) Property Tax Rate (%)
7,510	.493039	845.8	.056	.496709	1,043.2	.069
11,380	.523572	883.4	.041	.527469	1,043.2	.048
13,240	.535157	921.1	.037	.539140	1,043.2	.042
14,430	.541858	859.07	.032	.545891	1,043.2	.039
15,455	.547260	916.3	.032	.551333	1,043.2	.037
16,431	.552126	968.3	.033	.556236	1,043.2	.035
17,326	.556376	1,001.4	.032	.560517	1,043.2	.034
18,023	.559558	1,013.2	.031	.563723	1,043.2	.033
19,317	.565195	945.9	.028	.569402	1,043.2	.031
20,175	.568757	965.7	.027	.572990	1,043.2	.030
21,329	.573349	1,050.4	.028	.577617	1,043.2	.028
22,274	.576954	983.1	.025	.581248	1,043.2	.027
23,724	.582238	1,045.3	.026	.586572	1,043.2	.026
25,133	.587115	1,048.0	.024	.591485	1,043.2	.025
26,581	.591889	1,028.5	.023	.596294	1,043.2	.023
28,598	.598181	1,247.8	.026	.602633	1,043.2	.022
30,699	.604343	1,154.7	.023	.608841	1,043.2	.021
33,100	.610958	1,156.7	.021	.615506	1,043.2	.019
36,499	.619654	1,148.5	.019	.624266	1,043.2	.018
45,699	.640122	1,117.7	.016	.644886	1,043.2	.015
90,260	.706311	1,137.5	.009	.711568	1,043.2	.008

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[1] Source: All numbers are derived from data made available by the Division of Education Statistics, Pennsylvania Department of Education.

averaged $1,044 per student, the 90th percentile district (19th shown in column (1)) had to be selected as the key district. Column (2) shows the vector of prices for the 21 districts and column (3) contains that pattern of expenditures that result when we use each district's own values of the independent variables in regression equation (13). Column (4) shows the distribution of imputed property tax rates. The patterns displayed in these columns are similar to those derived under the DPE system when the median district was the key. Both the level of expenditure per student and the imputed tax rates are inversely related to the districts' levels of wealth.

Columns (5), (6), and (7) of Table 6 show the simulation results when we neutralize the effects of the independent variables other than wealth and price. That is, we assume that each district can be described by the values of the independent variables of the median district. In this case, establishing an average level of per student expenditure of $1,044 is insured by selecting the 75th percentile district as the key district. And once again we see in bold relief the major effect of DPE when the price elasticity of expenditure far exceeds in value the wealth elasticity of expenditure. Both expenditures per student and the imputed property tax rate are inversely related to school districts' levels of wealth.

The simulations shown in Table 7 are based on a WNS plan and produce expenditure patterns with a state-wide average of $1,044 per student. A curious feature of this simulation that in order to produce the state-wide average expenditure level of $1,044 per student it was necessary to employ a set of prices in which the price to all school districts was less than $1. Since WNS gives only a 1/7% price change for each 1% difference in wealth, a district with a level of wealth of $1,000,000 per student had to be chosen as the key district.[32] Column (2) of Table 7 shows the set of prices needed to produce the desired average level of expenditures.

Columns (3) and (4) show the patterns of expenditure per student and tax rates that result when using each district's own values of the independent variables in regression equation (13). The variation in expenditure per student from district to district is much less than under a DPE system. Yet, some divergence remains. It appears that on the average the level of spending is a bit higher in the richer districts. This pattern, however, is not due to wealth of the district, but to the impact of the other independent variables. With regard to the simulated property tax rates of column (4), the pattern is as expected. The rates are inversely related to district wealth.

The simulations shown in columns (5), (6), and (7) are calculated on the assumption that with the exception of the price and wealth variables each district has the same independent variable characteristics as the median district. To produce an average level of spending of $1,044 per student, a district with wealth per student of $750,000 had to be used as the key district. The patterns are, once again, predictable. In this case, expenditure per student is the same for each district. Perfect wealth neutrality in expenditure per student has been achieved. And once again the cost of such wealth neutrality is clearly seen; the property tax rate needed to achieve wealth neutrality declines with increasing levels of district wealth.

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[32] No district in Pennsylvania has a level of wealth per student as high as $1,000,000. Thus, in the simulations of Table 7 all districts face a price of education which is less than $1.

Part 3

Expenditure and Tax Rate Simulations: The Influence of the District's Property Mix.

In this part we examine how the property mix of local districts can affect the intra-state patterns of expenditure per student and tax rates. The ownership mix of district property between residents and nonresidents directly affects the price of education. For instance, if half of a district's property is owned by nonresidents and these nonresidents are unable to shift their taxes back onto residents, then the price of a dollar's worth of education to residents is \$.50.[33] Such a lowering of the price of education will induce an increase in their level of expenditure per student. The extent of the reaction, of course, depends on the estimated price elasticity of expenditure per student.

Two factors must be taken into account in analyzing the effect of the property mix on the level of expenditure. The first is to determine whether or not the property mix has any effect on the estimated value of β. The second factor concerns how the property mix related lower prices will affect the levels of expenditure per student and tax rates. Once we know the extent to which a district's price is lowered by the mix, we can use our estimated price elasticity and regression equation to simulate expenditure and tax patterns.

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[33] Nonresident property owners may be able to shift part of their tax burden onto residents by raising the prices of the goods they produce, by lowering the wages they pay local labor or perhaps by moving their capital goods out of the taxed area.

To determine whether the property mix affects the estimated value of β, we estimated our regression equation using a price variable expressed in the following manner:[34]

$$P_i = LS_i \; (1 - \ell_0 C_i - \ell_1 I_i) \qquad (14)$$

where

P_i = the price of education to the residents of the district.

LS_i = the local share for the i^{th} district = 1 minus the state aid ratio (SAR) implicit in the state funding scheme.

C_i = the fraction of the tax base in the i^{th} district that is classified as commercial property.

I_i = the fraction of the tax base in the i^{th} district that is classified as industrial property.

ℓ_0 = proportion of the commercial tax not shifted onto residents $(\leq \ell_0 \leq 1)$.

ℓ_1 = proportion of the industrial tax not shifted onto residents $(0 \leq \ell_1 < 1)$.

Equation (14) takes account of both the matching rate implicit in state grants and the mix of taxable property in a school district. For instance, a value of $\ell_0 = \ell_1 = 1$ implies that the incidence of the tax on commercial and industrial property falls entirely on nonresidents. In such a case $P_i = LS_i\ (1 - C_i - I_i)$ and the price of a dollar's worth of education within a school district is reduced by an amount equal to the fraction of total property value which is industrial and commercial.

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[34] This specification is taken from, Helen Ladd, "Local Education Expenditures, Fiscal Capacity, and the Composition of the Property Tax Base", National Tax Journal, June 1975.

Equation (14) is based on the asusmption that residents own all residential property in a district but none of the commerical and industrial property. This is, of course, not necessarily true. Moreover, there are no firm empirical estimates of the proportion of the tax burden which businesses could possibly shift back onto school district residents. To cope with this information gap, we have calculated the value of the price elasticity of expenditure (β) under a series of assumptions regarding the degree of possible tax shifting and the relative proportions of commercial and industrial property owned by school district residents.

The degree of tax shifting and the proportion of resident ownership of commercial and industrial property can be expressed through specifying the values of ℓ_0 and ℓ_1. For example, suppose that in a given school district one half of the total property value is commercial (i.e., $C_i = 1/2$). Furthermore, suppose that one-half of the commercial property is owned by residents and that two-thirds of the tax on commercial property cannot be shifted back onto residents. Under this set of conditions, one-fourth of the district's property value is owned by nonresidents and two-thirds of their taxes cannot be shifted back onto residents. Thus, the price of a dollar's worth of education to residents is reduced by 1/6 of a dollar ($\$1/6 = 1/4 \cdot 2/3 \cdot \$1$). This price reduction could have been expressed simply by setting $\ell_0 = 1/3$. That is, variations in ℓ_0 and ℓ_1 alone can capture our assumptions about both the degree of shifting and the ownership by residents of the commercial and industrial property. In the estimation of our regression equation we have experimented with several specifications of P based on different values of ℓ_0 and ℓ_1.[35]

The results of our empirical calculations show that the value of the price elasticity (β) tends to be remarkably stable with respect to different values ℓ_0 and ℓ_1. That is, for values of ℓ_0 and ℓ_1 ranging from .5 to 1.0, the value of the estimated price elasticity changed only slightly. For $\ell_0 = \ell_1 = .7$, the estimated regression equation is

$$\begin{aligned} (15) \qquad \ln E = {} & \underset{(2.51)}{.602} + \underset{(10.32)}{.129 \ln W} + \underset{(3.938)}{.061 \ln INC} - \underset{(5.08)}{.869 \ln P} \\ & + \underset{(23.15)}{.550 \ln LAGVAR} + \underset{(5.847)}{.078 \ln SBG} - \underset{(2.06)}{.037 \ln PERC} \\ & - \underset{(2.12)}{.012 \ln FED} + \underset{(6.579)}{.231 \ln WADM}. \end{aligned}$$

Table 8 reports the results of simulations which take account of the property mix. We assume a DPE subsidy plan in which the median wealth district is the key district. Column (2) shows the price of education to each district before we take account of the property mix. This set of prices is identical to that shown in column (2) of Table 4. To determine

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[35] The use of a value of ℓ_0 close to 1 means that most of the commercial property in a district is owned by nonresidents and that there is little shifting of the tax burden back onto residents. As the value of ℓ_0 decreases, we know that either the proportion of commercial property owned by nonresidents is decreasing or that a larger proportion of the tax is being shifted back onto residents (or both). Of course, as the values of ℓ_0 and ℓ_1 become smaller, differences in districts' property mixes between commercial, industrial and residential have a smaller impact on the price variable.

Table 8

Simulations of Educational Expenditure per Student and Imputed Property Tax Rates Across Pennsylvania School Districts Under DPE (Median Key)--Including the Property Mix[1]

(1) District Wealth per Student ($)	(2) Price without Effect of Mix (LS$_i$) ($)	(3) Price with Effect of Mix (P$_i$) ($)	(4) Expenditure per Student ($)	(5) Property Tax Rate (%)	(6) Expenditure per Student ($)	(7) Property Tax Rate (%)
7,510	.35210	.32625	1243.5160	.058302	1544.4628	.072411
11,380	.53355	.47463	968.2016	.045394	1151.2518	.053976
13,240	.62075	.45524	1071.1905	.050222	1221.6512	.057277
14,430	.67654	.64161	733.7174	.034400	897.1830	.042064
15,455	.72460	.63867	793.2530	.037191	909.4206	.042638
16,431	.77036	.65371	827.0935	.038778	897.2611	.042068
17,326	.81232	.64062	877.9379	.041162	920.9278	.043177
18,023	.84500	.75191	768.9822	.036053	797.2657	.037379
19,317	.90567	.78774	693.8728	.032532	770.5386	.036126
20,175	.94590	.78481	715.0496	.033525	777.7655	.036465
21,329	1.00000	.86585	764.5149	.035844	764.5149	.035844
22,274	1.04431	.88971	656.2010	.030766	701.1213	.032872
23,724	1.11229	.94901	662.5309	.031062	665.7832	.031215
25,133	1.17835	.96337	660.0980	.030948	661.6453	.031021
26,581	1.24624	1.08226	585.5543	.027453	598.0447	.028039
28,598	1.34080	1.00723	767.2340	.035971	645.8673	.030281
30,699	1.43931	1.27096	576.9492	.027050	524.8297	.024606
33,100	1.55188	1.30672	568.8830	.026672	516.6359	.024222
36,499	1.71124	1.26465	590.1484	.027669	539.7312	.025305
45,699	2.14258	1.49249	507.1617	.023778	476.6469	.022347
90,260	4.23180	3.31284	268.8076	.012603	248.2246	.011638

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[1] Source: All numbers are derived from data made available by the Division of Education Statistics, Pennsylvania Department of Education.

the change in price due to the property mix, we must make assumptions about the proportion of the tax burden on nonresidents which cannot be shifted back onto residents. For this simulation, we assume $\ell_0 = \ell_1 = .7$. This means we are assuming that the proportion of commercial and industrial property owned by nonresidents is such that after we take account of the degree of shifting of their property tax back onto residents, nonresidents pay $.70 of every dollar of tax on industrial and commercial property in the district.

Using these values for ℓ_0 and ℓ_1 and the values of C and I for a particular district, we can calculate the price faced by the district after taking account of the mix factor.[36] For example, the property value of the median wealth district in Pennsylvania is proportioned approximately as follows: 72% residential, 11% commercial and 17% industrial. The price equation assumes that all of the residential property value of the district is owned by residents and thus there can be no reduction in price from the taxation of this property. Taxation of commercial and industrial property does reduce the price of education to residents by the proportion of the tax base that is "external" to the residents (owned by nonresidents and the taxes cannot be shifted back onto residents). The assumption that $\ell_0 = \ell_1 = .7$ means that .7 of the industrial and commercial tax base is external to the residents. Thus, the mix factor lowers the price of education for the median (key) district from $1.00 to $.8058. The price faced by residents of the 21 districts is given in column (3).

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[36] Data on the property mix of districts was provided by the Pennsylvania State Assessment Board, Harrisburg, Pa.

Columns (4) and (5) show the patterns of expenditure per student and tax rates that emerge when we use the prices of column (3) and the values of the other independent variables that pertain to each district in regression equation (13). Comparing the results of this simulation to the results of the simulation in which we used the same DPE plan but didn't take account of the property mix (Table 4), districts now undertake a higher level of expenditure per student. Since districts now spend more but have the same guaranteed tax base as in Table 4, all districts now face a higher tax rate.

In terms of the distribution of the increases in expenditure per student, the 15th, 35th, 50th, 65th, 75th, 90th, and 95th percentile districts show large increases in expenditure per student due to the mix factors. In general, the mix factor appears to favor students of the relatively wealthy districts. The correlation coefficient between district wealth per student and the district proportion of nonresidential property is .088. This implies that, in general, wealthy districts tend to have a higher proportion of commercial and industrial property than poor districts and thus receive relatively large price reductions which lead to higher levels of expenditure per student.

Columns (6) and (7) show the patterns of expenditure per student and tax rates under a DPE plan in which we take account of the property mix but in which we assume that each district can be described by the values of the independent variables of the median wealth district other than wealth, mix and price. The patterns conform closely to the patterns revealed in columns (4) and (5).

Table 9 reports the results of simulations that are based on a WNS plan and take account of the price effects caused by districts' property mixes. The median wealth district is the key district. Column (2) shows the prices which districts face under WNS while column (3) shows the price faced by districts after also taking account of the property mix.[37]

Columns (4) and (5) show the patterns of expenditure per student and tax rates when we incorporate the districts' own values of the independent variables.[38] The differences in expenditure per student between districts are due to differences in property mixes and the other independent variables except wealth. The pattern is that expenditure per student tends to be higher in the richer districts. Since the direct effect of wealth has been neutralized by WNS, it must be true that the other independent variables are correlated with wealth (we have already established that the correlation coefficient between mix and wealth is .088).

However, as expected tax rates decline as a function of wealth under the WNS plan.

Columns (6) and (7) report the results of a simulation which employs a WNS plan and takes account of the price effects caused by districts' property mixes. Each district has its own values of wealth, mix and price

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[37] Column (2) of Table 9 is, of course, identical to column (2) of Table 5.

[38] The tax rate is calculated as

$$t_i = \frac{(LS_i)(E_i)}{W_i}$$

Even though P_i determines E_i, LS_i must be used to calculate the tax rate since the tax is applied to the entire tax base.

Table 9

Simulations of Educational Expenditure per Student and Imputed Property Tax Rates Across Pennsylvania School Districts Under WNS (Median Key)--Including the Property Mix[1]

(1) District Wealth per Student ($)	(2) Price without Effect of Mix (LS$_1$) ($)	(3) Price with Effect of Mix (P$_1$) ($)	(4) Expenditure per Student ($)	(5) Property Tax Rate (%)	(6) Expenditure per Student ($)	(7) Property Tax Rate (%)
7,510	.85993	.79679	540.3632	.061874	671.1381	.076848
11,380	.91318	.81234	586.3053	.047048	697.1534	.055943
13,240	.93339	.68451	732.0149	.051605	834.8346	.058854
14,430	.94507	.89628	537.0653	.035174	656.7186	.043011
15,455	.95450	.84130	613.3470	.037880	703.1683	.043427
16,431	.96298	.81716	671.5588	.039359	728.5315	.042698
17,326	.97040	.76528	743.6785	.041652	780.0941	.043692
18,023	.97595	.86843	672.2244	.036401	696.9492	.037740
19,317	.98578	.85742	641.0938	.032716	711.9280	.036331
20,175	.99199	.82306	683.9870	.033631	743.9786	.036581
21,329	1.00000	.80585	764.5149	.035844	764.5149	.035844
22,274	1.00629	.85732	679.3132	.030690	725.8156	.032791
23,724	1.01550	.86643	721.2882	.030875	724.8289	.031026
25,133	1.02401	.83719	752.5192	.030660	754.2832	.030732
26,581	1.03234	.89650	698.0724	.027111	712.9629	.027690
28,598	1.04331	.78375	969.6693	.035375	816.2798	.029779
30,699	1.05406	.93077	771.6436	.026495	701.9360	.024101
33,100	1.06560	.89726	808.0063	.026012	733.7978	.023623
36,499	1.08076	.79871	906.2540	.026835	828.8315	.024542
45,699	1.11646	.77771	931.9342	.022768	875.8517	.021398
90,260	1.23190	.96439	850.5416	.011609	785.4143	.010720

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[1] Source: All numbers are derived from data made available by the Division of Education Statistics, Pennsylvania Department of Education.

and has the median district's values of the other independent variables. Since WNS uses the price to neutralize wealth, the only remaining determinant of differences in districts' levels of expenditure per student is the property mix. We see quite clearly that the mix factor tends to favor the wealthier districts. And in this final case we see, once again, the very familiar pattern of tax rates declining as a function of wealth.

DPE and WNS Compared to the Existing Expenditure and Tax Distribution in Pennsylvania.

As a final point, it is of interest to compare the results of our simulations to the situation as it actually exists in Pennsylvania. Plotted in Figure 1 is the actual level of expenditure per student for Pennsylvania districts in 1976 and the simulated levels of expenditure per student expected to emerge under the DPE and WNS plans.[39] Figure 2 presents the tax rates that existed in 1976 and the tax rates generated by the DPE and WNS simulations.

Figure 1 shows that under the existing subsidy system used in Pennsylvania, expenditure per student rises as a function of wealth. The poorest district has expenditure per student of $696 while the richest district has expenditure per student of $1,861. The DPE system would completely reverse the wealth bias. Poor districts would be led to spend at very high levels ($1,912 per student for the poorest district) while rich districts would be induced to spend at low levels ($353 per student for the richest district).

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[39] The simulations plotted in Figures 1 and 2 are those in which the average level of expenditure per student was set equal to the actual average level of expenditure per student in 1976 ($1,044).

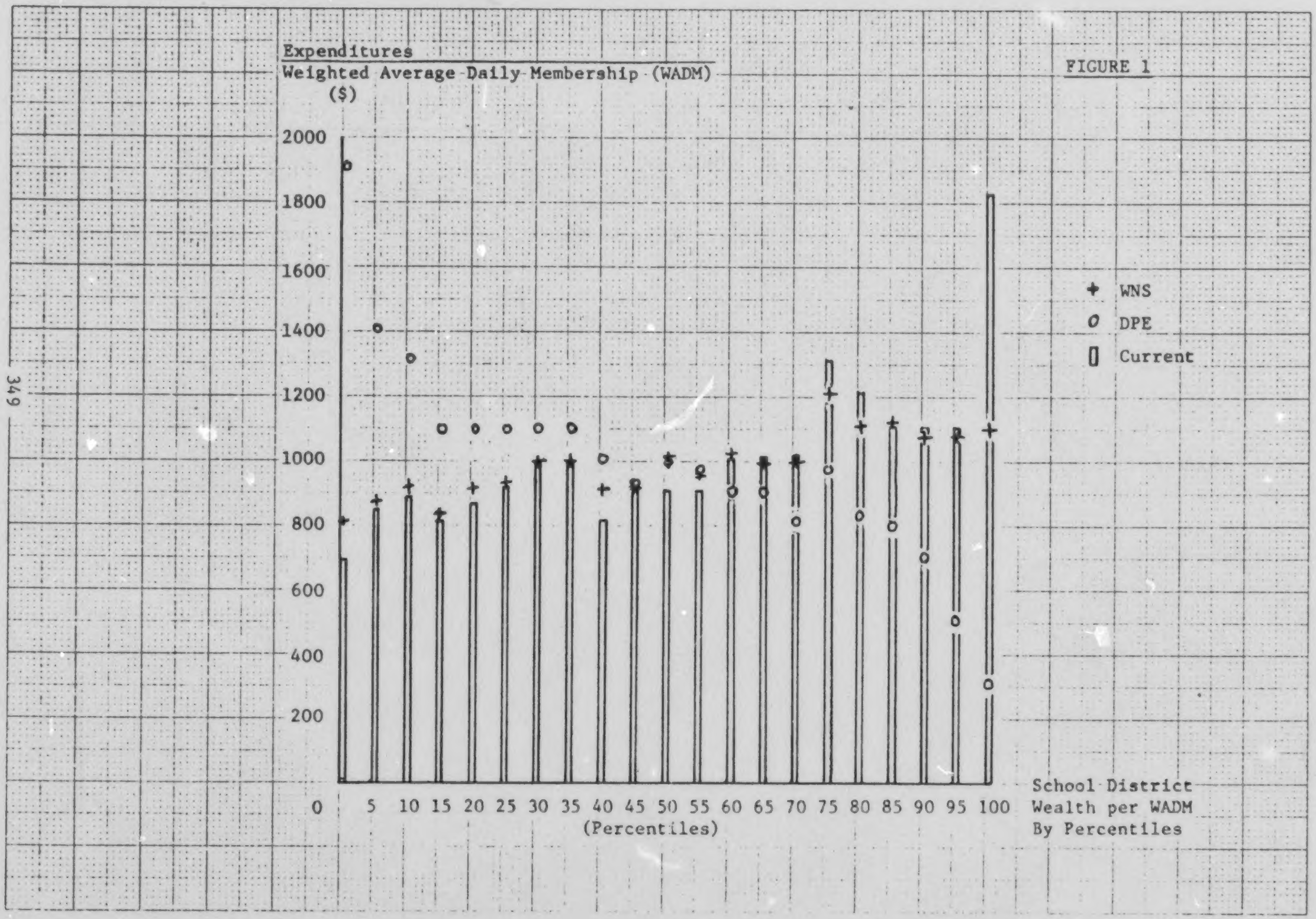

Expenditures
Weighted Average Daily Membership (WADM)
($)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
(Percentiles)
School District
Wealth per WADM
By Percentiles
+ WNS
o DPE
▯ Current

FIGURE 1

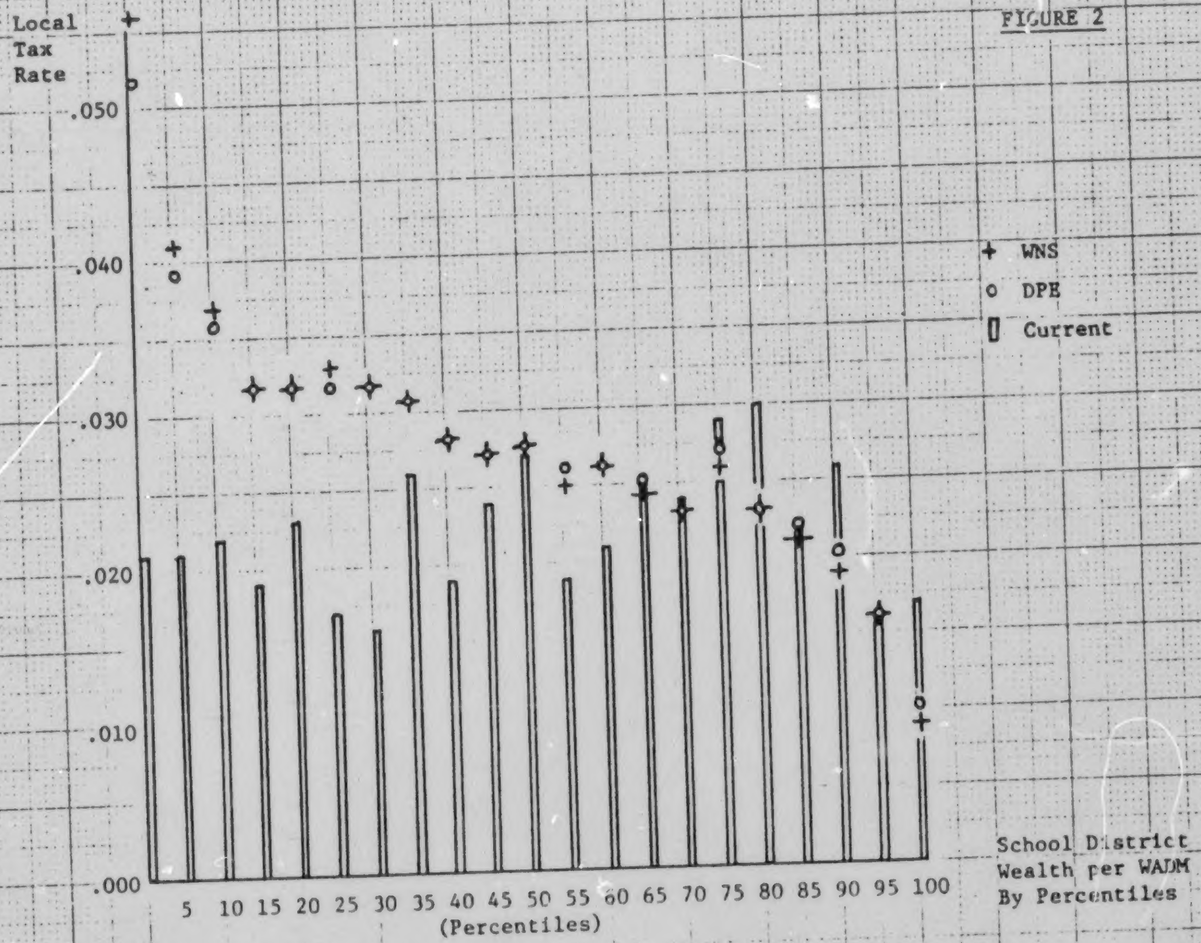
This result is due, of course, to the wide range of prices given by DPE combined with districts' strong responsiveness to price effects.

In comparison to the actual system, the adoption of WNS would reduce the differences in the level of expenditure per student between poor and rich districts. Under WNS the poorest district would spend $845 per student while the richest district would spend $1,137 per student. Although there remains a positive relation between expenditures and wealth, this relation must be due to factors that are positively correlated with wealth (such as property mix) since the direct effect of wealth has been neutralized. For districts in the middle of the wealth range, the levels of expenditure per student under WNS and the current system would be nearly identical. The main effect of WNS would be to reduce the disparities in expenditure per student between poor and rich districts.

Figure 2 permits us to compare actual tax rates with those that would be generated under DPE and WNS. There is no clear trend in tax rates as a function of wealth under the current system. However, under both DPE and WNS tax rates fall as a function of wealth. Under DPE the elasticity of the tax rate with respect to wealth is $(\alpha + \beta)$. Since we have estimated that $\alpha = .13491$ and $\beta = -.9333$, this means that the tax rate falls by .7984% for each 1% increase in wealth. For WNS the wealth elasticity of the tax rate is $(- \frac{\alpha}{\beta} - 1)$. Thus, in this case, given the values of α and β, the tax rate falls by .855% for each 1% increase in wealth.

Under DPE poor districts would face relatively high tax rates because DPE would induce them to undertake high levels of expenditure. By providing a 1% change in price for each 1% difference in wealth DPE guarantees that

FIGURE 2


Local
Tax
Rate
.050
.040
.030
.020
.010
.000
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
(Percentiles)
+ WNS
o DPE
▯ Current
School District
Wealth per WADM
By Percentiles

each district can command funds for education as if it had the tax base of the key district. But given the same tax base and spending more, poor districts must face higher tax rates than richer districts.

Under WNS, poor districts would be given a 1/7% change in price for each 1% difference in wealth. Since the state subsidy is less than the difference in wealth, the guaranteed tax base of poor districts is less than the tax base of wealthy districts. Given that all districts undertake about the same level of expenditure the poor districts with the smaller guaranteed tax bases must face higher tax rates than wealthy districts. This bias in the treatment of taxpayers is the cost of achieving the equitable treatment of students.

VI.
SUMMARY AND CONCLUSIONS

This paper has examined the equity implications for both students and taxpayers of adopting either a district power equalizing system (DPE) or the wealth neutral system of Martin Feldstein (WNS). Both DPE and WNS are matching rate systems in which the state pays a portion of the school district's budget. Both systems attempt to offset the effects of wealth differentials on expenditure per student by lowering the price of education of poor districts. The DPE and WNS plans differ in the size of the price reduction given to poor districts. The DPE plan gives a 1% change in price for each 1% difference in wealth. In determining the size of the price reduction, WNS takes account of districts' responsiveness to price changes (price elasticity of educational expenditure) and gives a poor district a price which is low enough to just offset the influence of the wealth differential on expenditure per student. WNS achieves wealth neutrality in the sense that two districts which are alike in all respects other than wealth will actually spend the same amount per student. DPE does not, in general, achieve wealth neutrality since it ignores districts' responsiveness to price changes.

To determine how Pennsylvania students and taxpayers would be treated under the two plans we have estimated the school district expenditure responsiveness to price changes (price elasticity) and wealth differences (wealth elasticity). The value of (β) the price elasticity was calculated to be -.9333 while the value of the wealth elasticity (α) was .1349. Thus, school districts in Pennsylvania are estimated to be approximately seven times as responsive to price effects as to wealth effects.

In terms of the treatment of students, WNS achieves wealth neutrality by giving districts a 1/7% change in price for each 1% difference in wealth. Since Pennsylvania school districts are more responsive to price effects than to wealth effects, the DPE plan which gives a 1% price change for each 1% difference in wealth would stimulate poor districts to spend at higher levels than wealthy districts.

The treatment of taxpayers under the two systems can be stated using the revenue identity that applies to each school district.[40]

$$P_iE_i = t_iW_i \tag{S.1}$$

A simple rearrangement shows that DPE guarantees that expenditure per student per 1% of tax rate is independent of school district wealth (effort equity).

$$\frac{E_i}{t_i} = \frac{W_i}{P_i} \tag{S.2}$$

Under DPE price differs among school districts by 1% for each 1% difference in wealth. Thus, the left hand side of (S.2) (expenditure per student per 1% of tax rate) is the same for all districts.

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[40] See footnote 11 for a discussion of this revenue identity.

However, in Pennsylvania both DPE and WNS would fail to achieve taxpayer equity. The local tax rate of a district is

$$(S.3) \qquad t_i = \frac{P_i E_i}{W_i}$$

Taxpayer equity requires that districts with the same preference for education face the same tax rate. This condition will not be satisfied under DPE. DPE would induce poor school districts to spend more per student than rich districts. Since, in essence, DPE gives each school district the same guaranteed tax base it necessarily follows that in order to finance their higher level of expenditure, poor districts will have to tax their residents at higher rates than those used in wealthier districts.[41]

Under WNS, two districts with identical preferences for education but with different wealth levels are led to spend the same amount per student. However, the adjustment in price needed to assure expenditure equity makes impossible the attainment of taxpayer equity. In this system expenditure per student is equalized among districts by lowering the price of education by 1/7% for each 1% increase in wealth, a situation which implies that poorer districts will have to employ higher tax rates than wealthier districts.[42] Thus, it appears that there exists a fundamental conflict between the achievement of expenditure and taxpayer equity.

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[41] The exact relation between wealth and the tax rate under DPE is discussed on page 13.

[42] The exact relation between wealth and the tax rate under WNS is discussed on page 21.

A final concern of this paper was to determine the effect of the property mix (the proportion of the property value owned by residents vs. nonresidents) on the patterns of expenditure per student and tax rates. The ownership of property by nonresidents lowers the price of education to residents. Responding to this lower price of education, districts undertake higher levels of expenditure per student and face higher tax rates than would be the case if all property were owned by residents.[43] It was found that the mix factor tends to favor the students of the relatively wealthy districts. The correlation coefficient between district wealth per student and the district proportion of nonresidential property is .088. Thus, wealthy districts tend to have a higher proportion of nonresidential property and thus receive relatively large price reductions which lead to higher levels of expenditure per student.

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[43] The behavior of tax rates due to the mix is discussed on pages 53 and 54.

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TOWARDS THE DEVELOPMENT OF MORE COMPREHENSIVE MEASURES OF SCHOOL DISTRICT WEALTH*

Introduction and Overview

Most states today still use property valuation as the sole measure of the ability of school districts to provide educational services. Yet there is increasing concern, prompted in part by legal challenges, that broader measures of fiscal capacity are warranted. Significantly, seven states have recently undertaken revisions of their basic measures. In most cases, income has been included along with property as an additional fiscal capacity variable. However, there remains the problem of the best method of combining the two, as well as the appropriate weights to associate with each.

In the present paper, we shall examine more closely the problems encountered in including both income and property wealth in an index of school district fiscal capacity. Several alternative ways of combining the two will be explored, with special focus being directed to four states. We shall also analyze how the various alternative combination and weighting schemes tend to affect the relative rankings of district fiscal capacity by geographical type (urban, rural, etc.). Finally, the implications of these alternative fiscal capacity measures with respect to the magnitude of state aid and the achievement of fiscal neutrality shall be explored.

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The report is divided into four major chapters. Chapter I discusses the arguments for including income as an additional component of fiscal capacity from both an economic and a judicial standpoint. It also examines the various ways in which a handful of states have recently broadened their fiscal capacity measures along these lines.

Chapter II reviews and critiques the various methods which have been suggested for formulating measures of fiscal capacity. Then focus is directed to the states of Pennsylvania, Ohio, Kansas and Minnesota as empirically-based weights for income and property are derived via least-squares regression analysis. An alternative method of deriving weights via the conversion of property into an income flow will also be utilized. As will be seen, the weights accorded income and property tend to vary greatly depending on the approach used.

In Chapter III the fiscal consequences of utilizing the alternative wealth measures developed in Chapter II are examined. First of all, attention is directed to changes in the average level and dispersion of fiscal capacity by district type over the four states studied. Next, changes in the level of state aid are simulated using the aid formulas currently in effect. Finally, where possible, the fiscal neutrality consequences of these state aid changes are examined.

In Chapter IV, the final chapter, a brief summary of the important findings is presented.

CHAPTER I

Current Measures of School District Wealth: Limitations and Legal Issues

In most states today, the amount of state aid distributed to local school districts via aid formulas is inversely related to the amount of property wealth per pupil in the school district. Property wealth[1] supposedly measures the fiscal capacity of the school district or the ability to raise taxes locally for school support. There has developed growing dissatisfaction in recent years, however, with this method of measuring district wealth for aid distribution purposes. Principally, it has been argued that property wealth itself is inadequate as the sole measure of a district's fiscal capacity. It is contended that local income should be considered as an additional factor in measuring a district's ability to support public education.

There are numerous reasons for arguing that income should be included as an additional measure of wealth. In the first place, regardless of the specific type of tax levied (property tax, income tax, etc.), income is almost always the ultimate source of the payment of the tax. Hence, it may be a better indicator of the ability to pay the tax.[2] It would make little sense, for example, to tax property where there is little or no income, as the existence of property tax "circuit breakers" for the elderly in some states gives witness to.

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[1] Throughout this paper the terms school district "wealth" and "fiscal capacity" will be used synonomously.

[2] See Allen Odden, Alternative Measures of School District Wealth (Denver: Education Commission of the States, 1976), p. 10.

Because school districts in some states (e.g., Iowa) are empowered to levy income taxes, income is an obvious additional component of such districts' ability to raise tax dollars. Even where a school district is a part of another governmental body (e.g., New York City), income taxes levied by the governmental body are often used to finance educational expenditures. What the above cases illustrate is that restricting fiscal capacity to property wealth alone may result in understating the ability of some school districts to raise tax dollars.[3]

In addition, there is a growing body of evidence that income is an important determinant of school district expenditures in many states. As Allen Odden has pointed out, the coefficient of correlation (r) between income per pupil and state and local expenditures per pupil is +0.56 in Connecticut. In Colorado and Washington respectively, the coefficient of correlation between median family income and state and local expenditures per pupil is +0.36 and +0.40.[4] Moreover, as will be pointed out below, income per pupil and local expenditures per pupil are highly correlated in each of the four states which are the subjects of the present analysis (Pennsylvania, Minnesota, Ohio and Kansas.)

The case for including income as a supplementary measure of school district wealth is made even more convincing when it is realized that property values and income are not always highly correlated, as Table 1 indicates. For districts in the thirteen states listed in the table, the correlation coefficients between property wealth and income are generally small and often not significantly different from zero. What this implies,

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[3] Ibid.

[4] Ibid., pp. 11-12.

TABLE 1

Correlation Coefficients between Property Wealth Per Pupil and Various Income Measures

	Correlation Between Property Wealth Per Pupil and	
State	Income Per Pupil	Income Per Household
California (1971)[1]	--	0.15
Colorado (1975)[2]	0.38	-0.15
Connecticut (1975 and 1970)[2]	--	0.14
Florida (1975 and 1970)[2]	--	0.24
Kansas (1975-76)[3]	0.56	--
Minnesota (1975)[3 and 2]	0.32	0.20
Missouri (1975)[2]	0.39	0.19
New Jersey (1975 and 1970)[2]	--	-0.20
New York (1975 and 1970)[2]	--	0.01
Ohio (1977)[3]	0.13	--
Oregon (1975 and 1970)[2]	--	-0.09
Pennsylvania (1975)[3]	0.53	--
Texas (1975 and 1970)[2]	--	-0.03

The above table is an expanded version of that appearing in Allen Odden, School Finance Reform in the States: 1978 (Denver: Education Commission of the States, 1978), p. 18. The date(s) in parentheses refer to the years corresponding to property wealth and income respectively. The footnote numbers refer to the sources listed below.

Sources:

(1) Arthur Alexander, Inequality in California School Finance: Dimensions, Sources, Remedies (Santa Monica: Rand Corp., 1975), p. 41.

(2) Allen Odden, School Finance Reform in the States: 1978 (Denver: Education Commission of the States, 1978), p. 18.

(3) Data files of the present author.

of course, is that high property wealth districts may also be low income districts (and vice-versa). Examples of the former include some large cities where property values are high but average incomes are low. Farm communities constitute another situation of a high-property-value/low-income mixture. On the other hand, in many residential suburbs of large cities, precisely the opposite situation may occur.[5] The upshot of the low observed correlation between the two variables is that both property and income should be included in a more comprehensive measure of a district's fiscal capacity.

Why Alternative Measures of District Wealth Are an Issue

In the now famous *Serrano v. Priest* decision of the California Supreme Court in 1971, it was ruled that the quality of a child's education may not be "a function of the wealth of his parents and neighbors" without violating the equal protection clause of the Fourteenth Amendment to the United States Constitution.[6] The Court's ruling, of course, underscores the necessity of deriving accurate and equitable measures of local wealth. Interestingly, the California court implicitly accepted taxable property values as a legitimate measure of district wealth or fiscal capacity. However, as Akin has pointed out:

> There is little reason to believe that later decisions of this type will not take the position that effective equalization of taxable property values does not necessarily constitute equalization of ability to finance education....It seems

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[5] *Ibid.*

[6] 5 Cal. 3d 584, 487 P. 2d 1241, 96 Cal. Rptr. 601 (1971).

> obvious that research into methods of measuring local revenue raising capacity which are superior to the simple measurement of taxable property is called for if the intent of the Serrano decision...is to be fulfilled.[7]

Two years after the Serrano decision, the U.S. Supreme Court concluded in the Rodriquez case that a school finance system which generated differences in educational opportunities did not violate the Fourteenth Amendment.[8] Nevertheless, litigation has proceeded apace at the level of the state courts, albeit under changing school finance litigation strategies. One of the most important recent decisions is that of Cincinnati v. Essex of the Ohio District Court in 1977. Although Ohio passed a guaranteed yield program in 1975 intended to produce a fiscally neutral system, the Ohio District Court has gone beyond the simple property wealth aspect of fiscal neutrality. Instead, it has suggested that educational opportunity should not depend on either local income or local voter choice.[9]

Even in the absence of school litigation problems, however, the proper measurement of wealth is an important question to citizens and policymakers for the purpose of gauging tax effort. In most states, the amount of aid forthcoming to a school district from the state is a function of a district's tax effort. Tax effort, by definition, is the ratio of tax revenues to fiscal capacity. As Akin puts it, "The relative effort involved in raising a certain amount of revenue can be accurately estimated only if relative abilities to raise revenues are known."[10] The problem of measuring fiscal capacity, of course, is not unique to school districts. The federal government uses formulas to distribute health and public welfare aid, e.g., to states in a manner inversely proportional to state ability to pay. Significantly, the federal government uses state per capita personal income as the ability to pay measure.

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[7] John Akin, "Fiscal Capacity and the Estimation Method of the Advisory Commission on Intergovernmental Relations," National Tax Journal, Vol. XXVI, No. 2 (June 1973), p. 276.

[8] San Antonio Indep. School District v. Rodrequez, 411 US 1(1973).

[9] For an excellent review of recent school finance litigation, see A. Odden, School Finance Reform in the States: 1978, pp. 9-13.

The Current Use of Income as a Component of Fiscal Capacity

Realizing the importance of broader measures of district fiscal capacity, several states in recent years have begun to utilize some form of income measure to supplement their property wealth measures for the purpose of providing state aid to school districts. The attempts have been of two major types:

1) Property valuation has been adjusted (multiplied) by an income ratio, the ratio being the ratio of district income (per family) to the median (per family) income of the state. Rhode Island and Connecticut currently use this form of adjustment and utilize income figures derived from the Bureau of the Census. Information from this source is not available on an annual basis.

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[10] Akin, op. cit., p. 275.

2) Income has been added to property valuation (with implicit or explicit weights applied to each) in order to achieve an additive index of property and income wealth. Kansas and Pennsylvania are examples of this type.

As Table 2 shows, currently seven states utilize one of the two forms of income-adjusted wealth measures as described above. Significantly, similar wealth measures are being seriously considered in several other states. In fact, seventeen states in all are beginning to compile income data by school district in anticipation of altering their school district wealth measures in the near future.[11] In most of these states, this has been mandated by the legislatures by requiring taxpayers to identify school districts on their state tax returns.

The inclusion of income as an additional component of fiscal capacity is only half of the problem, however. The other half is that of the appropriate system of weights to associate with income vs. property. Reference once more to Table 2 will show the substantial differences which exist among the seven states now using income in their fiscal capacity measures. Kansas, for instance, uses an effective 50-50 weighting system for property valuation and resident taxable income. The Maryland weighting scheme is essentially the same as that in Kansas. The Pennsylvania measure, on the other hand, attaches a 60% weight to property valuation per pupil and a 40% weight to personal income per pupil. The states of Connecticut and Rhode Island use the ratio of district family income to state family income

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[11] Educational Testing Service, Educational Policy Research Institute, A School Finance Researcher's Guide to Personal Income for the Fifty States, (Washington: December, 1978), p. 2.

Table 2

States in Which Both Income and Property are Used
in Measures of Local Ability to Support Schools

State	Description
Connecticut	Property valuation per capita modified by ratio of town's 1969 median family income to state average.
Kansas	Four-year average of adjusted property valuation plus resident taxable income in the district.
Maryland	Property valuation and taxable income per pupil.
Missouri	Property valuation per pupil, with an income factor used to adjust the required local effort in the foundation part of the aid formula. (The income factor is computed as 50% of the deviation of a district's adjusted gross income per return from the statewide average.)
Pennsylvania	District wealth measure is 60% dependent upon property valuation per pupil and 40% dependent upon personal income per pupil.
Rhode Island	Equalized property valuation per pupil modified by a median family income ratio.
Virginia	Composite index including real property valuation, individual income, and sales tax on both a per pupil and a per capita basis.

Source: John Augenblick, School Finance at a Third Glance (Education Commission of the States, January 1978).

to weight property valuation. Such a ratio effectively constitutes the equivalent of a variable additive weighting system for income and property.[12]

What the above discussion of these broader measures of fiscal capacity used in seven states shows is a lack of agreement on just how much importance should be attributed to income. Most likely, the weights currently

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[12] To see the nature of the variable weighting system implicit in a multiplicative income-ratio scheme, imagine a state with three school districts with (per student) property wealth and income levels as listed in the table below:

District	Property Wealth(P)	Income(I)
A	\$200	\$100
B	80	150
C	100	125

Assume that all three districts are of the same size, making $\bar{I}$ = \$125. If the measure of fiscal capacity is defined as property wealth alone, district A's fiscal capacity is \$200, district B's is \$80, and District C's is \$100. With an income-ratio weighting scheme for property wealth, however, district A's "adjusted" fiscal capacity (FC_A) would be:

$$FC_A = (I_A/\bar{I})\ P_A = 160$$

In a similar fashion, it can be seen that $FC_B = 96$ and $FC_C = 100$.

To see what system of (additive) weights for property and income the above ratio-scheme is equivalent to, it is necessary to solve the following equation:

$$FC_A = W_i I + W_p P$$

where FC_A is the "adjusted" fiscal capacity of the district in question and W_i and W_p are the income and property weights. Imposing the constraint that $W_i + W_p = 1$, it can be shown that for district A, $W_i = .40$ and $W_p = .60$. For district B, $W_i = .228$ and $W_p = .772$. In district C, whose income level is at the mean, the property weight is 1.0 and the income weight is 0.0.

Therefore, it can be seen that a multiplicative income-ratio weighting scheme for property wealth (such as that in Connecticut and Rhode Island) is equivalent to a variable additive weighting scheme for income and property, where the weights would differ from district to district depending upon the values of Y and P.

in use reflect partly political compromise and partly uncertainty. But it is important to realize that the determination of a logical and defensible system of weights is an important matter for the purpose of evaluating expenditure and taxpayer equity of school finance programs.

CHAPTER II

Measuring School District Fiscal Capacity

In Chapter I we discussed the rationale for including income along with property as an additional component of fiscal capacity. In this chapter we shall discuss some of the general methods which have been suggested in the economics and school finance literature for combining the two. After noting their strengths and shortcomings, we shall then attempt to derive a set of appropriate weights for income and property for the four states which shall serve as the focal point of our analysis --Pennsylvania, Ohio, Kansas, and Minnesota.

Previous Efforts to Measure Fiscal Capacity

Most approaches to measuring the fiscal capacity of a given jurisdiction may be classified into one of two basic types:

1) those which measure capacity as a function of economic indicators (e.g., property wealth and income),
2) those which define capacity in terms of the tax bases available to a government and the amount of revenue which could be produced by taxing these bases.[1]

Because of the dominance of the property tax as the vehicle for financing local educational expenditures, the tax base method has tended (until recently) to be the approach most frequently advocated and used.

Nevertheless, in two very early studies, attempts were made to link income and property wealth into an index of fiscal capacity in line with the economic indicator approach. In their 1923 study, George Strayer and

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[1] Advisory Commission on Intergovernmental Relations, Measures of State and Local Fiscal Capacity and Effort (Washington, D.C.: U.S. Government Printing Office, 1962), pp. 3-11.

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Robert Haig calculated a county index of ability to pay for the state of New York.[2] The taxable income for the county in question was added to 10% of the market value of the county's property. The sum was then divided by two to yield the index. The logic underlying the weighting system, unfortunately, was not made clear. Strayer and Haig mentioned only that "the statistical problem involved in establishing the precise weight(s) . . . cannot be solved with exactness with the resources at the disposal of the Commission."[3] Three years later, John Norton developed a similar index for the states.[4] His fiscal capacity index was specified as the sum of income plus one-tenth the value of tangible property in the states. Norton, as did Strayer and Haig, noted the "inadequacy" of his index from a strictly scientific point of view. Nevertheless, he noted that it made little difference in determining the relative fiscal capacity rankings of the states whether as much as 1/3 or as little as 1/20 of property wealth was combined with income.[5]

As William Sparkman points out, these two early methods were seldom used after their initial appearance.[6] However, the underlying principle has enjoyed a renewed interest in the 1970's, as witnessed by the seven states which have most recently broadened their fiscal-capacity measures along the lines first suggested by Strayer-Haig and Norton.

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[2] George Strayer and Robert Haig, The Financing of Education in the State of New York, Educational Finance Inquiry Commission (New York: The MacMillan Company, 1923), p. 172.

[3] Ibid., p. 171.

[4] John K. Norton, The Ability of the States to Support Education (Washington, D.C.: National Education Association, 1926), p. 17.

[5] Ibid.

[6] William Sparkman, "The Relationship Between Socioeconomic Variables and State Effort for Education," Journal of Education Finance, 2 (Winter 1977), pp. 337-38.

The ACIR Tax Base Method

The Advisory Commission on Intergovernmental Relations (ACIR) has put forth what is probably the best known method for measuring fiscal capacity, the so-called "representative tax system" approach.[7] The ACIR method consists of estimating a single rate for each type of tax, a rate which when levied simultaneously upon all taxed jurisdictions will yield the actual tax revenue of that type which has been collected for all jurisdictions. When this single rate is multiplied by the taxable base of the jurisdiction in question, the resulting figure is the "fiscal capacity" of that jurisdiction as defined by the ACIR for this particular type of tax. For the base of other types of taxes, a similar procedure is followed. To calculate a measure of total fiscal capacity for a given jurisdiction, the simple summation of each of the separate tax-specific fiscal capacities is undertaken. In essence, the ACIR representative tax system approach is equivalent to a weighted-average tax rate based on the actual rates used by all the jurisdictions in a given population. The product of this weighted average tax rate and the tax base in question yields the fiscal capacity.

Despite the simplicity and logic in the ACIR method, there are a number of problems with the approach which have been pointed out by John Akin.[8] The most serious of the criticisms is the ACIR's treatment of various tax bases as independent when in fact they are not. As Akin puts it, "The average relationship of each base to its tax revenues is determined with no allowance for the fact that the heavy use of one base may preclude the heavy use of another because of the constraint of income and wealth."[9] For example, it is generally recognized that income is usually the ultimate source of the payment of a tax, whether that tax is a property tax, sales tax, etc. Consequently, the heavy use of any particular tax type would tend to logically reduce the ability of the jurisdiction to use any of the other tax types. Better put, the separate fiscal capacities for each tax type are directly dependent upon one another. Yet, the ACIR method makes no allowance for such dependence. Theoretically, no matter how heavily (or lightly) taxed a jurisdiction happens to be in any one tax category, its fiscal capacities for the other tax types remain unaffected. Because of this serious flaw in the ACIR method, Akin has suggested that an alternative methodology be utilized, one which (like multiple regression) allows for the relationship between alternative tax bases to be analyzed. Further discussion of this methodology will be presented later in this chapter.

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[7] Advisory Commission on Intergovernmental Relations, Measuring the Fiscal Capacity of State and Local Areas (Washington, D.C.: U.S. Government Printing Office, 1971).

[8] Akin, op. cit., pp. 278-81.

Problems of independence aside, our reason for not utilizing the ACIR approach in the current study is more basic. The ACIR tax base method allows the inclusion of only those tax bases which are actually taxed by the jurisdiction in question. Since school districts in most states do not have the power to tax income directly, strict adherence to the ACIR method would preclude the addition of income in a measure of school district fiscal capacity.

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[9] _Ibid._, p. 278.

The Conversion of Property Wealth to an Income Flow

In a significant and novel approach to the fiscal-capacity measurement issue, Walter McMahon[10] has applied a method first suggested by Weisbrod and Hansen.[11] Since income is essentially a flow measure and property a stock measure, McMahon suggests converting income and property to the same terms. This can be done in either of two ways: a) by converting property values into an income flow (or annuity per period) which can then be added to current income to obtain a generalized income flow measure; b) by obtaining the present value of the current and expected income stream from human capital and financial wealth and adding it to the market value of property in order to derive a generalized wealth stock measure.

After analyzing the two alternative methods, McMahon shows that both of the methods give the same relative weights to income and assets; i.e., they are essentially equivalent. More importantly, however, McMahon has demonstrated how a simple conversion rate can be utilized for the purposes of converting property to an income flow or income to a stock term. The conversion rate in effect becomes the "weight" to apply to the term to be converted. For example, suppose it is desired to convert property into an income flow, and the property conversion rate equals .07. Then for the purpose of deriving an income-based measure of fiscal capacity for a given district, the total value of the district's property should be multiplied by .07 and added to total district income. The result would be the district's fiscal capacity, inclusive of income and property.

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[10] Walter McMahon, "A Broader Measure of Wealth and Effort for Educational Equality and Tax Equity," University of Illinois Faculty Working Paper #475, March 28, 1978.

[11] Burton Weisbrod and W. Lee Hansen, "An Income-Net Worth Approach to Measuring Economic Welfare," American Economic Review, Vol. 58 (December 1969), pp. 315-29.

The McMahon weighting scheme will be discussed at greater length later in this chapter. From the preceding discussion, however, it should be clear that there is widespread variation in the way in which income and property wealth are treated both in the measures of fiscal capacity which have been proposed in the school finance literature and in the measures which are currently in use in several states.

Alternative Fiscal Capacity Measures: A Four-State Analysis

In the remainder of this chapter, we will attempt to analyze the question of the best way to combine income and property wealth into an additive index of school district fiscal capacity. For the reasons mentioned in the previous pages, we reject the arbitrary weights given income and property in the seven states which currently include income as a component of district fiscal capacity. We will also avoid the representative tax system approach of the ACIR, inasmuch as the ACIR approach would exclude income as a component of local school district fiscal capacity.

Instead, we will utilize the methods proposed by John Akin and by Walter McMahon. Akin suggests that the relative importance of income and property (as well as other factors) in determining levels of governmental expenditure can be ascertained by the use of multiple regression analysis.[13] By regressing local governmental (here school district) expenditures on income and property wealth, the relative importance of the two in determining actual expenditure levels may be estimated. In contrast, the McMahon approach consists of converting income and property wealth into the same flow (or stock) terms.

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[13] Akin, op. cit.

Both the Akin and McMahon methods appear to have solid (though different) logical bases for deducing appropriate weights. The multiple-regression approach is essentially a way of ascertaining the appropriate weights based on observed school district expenditure behavior. It is purely an empirical approach to the weight determination problem, as opposed to the theoretical method proposed by McMahon.

These two alternative weighting schemes will be analyzed and tested separately with respect to four states: Pennsylvania, Ohio, Kansas, and Minnesota. Several reasons lay behind the selection of these particular states. One of the most important was the availability of income data. All four states are among the group that now collect income by school district. Moreover, two of the four states (Pennsylvania and Kansas) are now using wealth measures which are based on both district income and property, although the weights associated with each differ. The other two states currently use only property as the measure of district wealth. As has been previously mentioned, however, the Ohio District Court decision of Cincinnati vs. Essex has recently brought into question the constitutionality of the Ohio wealth formula. Minnesota, lastly, is another state in which recent fiscal reforms have been undertaken.

The Regression-Based Weighting System

In the multiple regression approach to deriving weights for income and property, we shall attempt to determine the linear combination of the two variables which best explains the actual spending practices of all school districts in a given state. Specifically, if E stands for per pupil educational expenditures (or revenues) from local sources, if I equals income per student, and if P represents property wealth per student, then the relative importance of the two independent variables (I and P) may be ascertained by estimating the least-squares regression equation:

$$(1) \qquad E = a + b_1 I + b_2 P$$

where a is the constant (intercept) term and the b's are the net regression coefficients. These coefficients will indicate how much of a difference in local educational expenditures is associated with a $1 difference in either income or property per pupil on the average for the districts analyzed. As such, the relative magnitudes of the two coefficients may be considered to represent the "weights" or relative importance of income vs. property as determinants of district educational expenditures. (These raw weights may then be converted into percentage weights which sum to 1.)

A possible objection to this method might be raised at this point. The proposed equation explains differences in district expenditure per pupil on the basis of only two variables--I and P. But certainly other factors than simply I and P also serve to explain differences in district spending. For example, in their study of district expenditures in Minnesota and Colorado, Vincent and Adams utilized such variables as the percentage of minority pupils, density, and many other variables to explain district expenditures.[14]

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[14] Phillip E. Vincent and E. Kathleen Adams, Fiscal Responses of School Districts (Denver: Education Commission of the States, 1978).

The answer to this objection of restricting the regression equation to only two explanatory variables is quite simple. In virtually all states the measure of fiscal capacity currently in use is based solely on either property alone or property plus income. Consequently, the state subsidy plans distribute state aid only on the basis of where a district stands with respect to one or both of these variables. What is more, while it is true that other factors (such as the number of minority pupils, density factors, etc.) may well influence the amounts of state aid received by a district, they generally do not do so through the basic state aid subsidy formula.

A second consideration should also be addressed here. In cases where the variables are in different units or of different orders of magnitude, it is sometimes suggested that "beta coefficients" be estimated instead of the partial regression coefficients. Beta coefficients (or standardized regression coefficients) are simply the result of estimating the equation with all variables in standard deviation units. Consequently, each beta coefficient will indicate how much of an effect a one standard deviation change in (e.g.) income per student will have on local district expenditures (again, in standard deviation units).[15] Yet a third alternative is to estimate the regression equation with all variables expressed in logarithmic form. The advantage of this transformation is that the regression coefficients will indicate the percentage change in local district expenditures per pupil generated by a one percent change in (e.g.) income per pupil. Expressed in such a way, the coefficients of the logarithmic regressions may be interpreted as "elasticities."

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[15] For a fuller discussion of the use of beta coefficients, see Mordecai Ezekiel and Karl Fox, Regression Analysis, 3rd edition (New York: John Wiley and Sons, 1959), pp. 196-97.

In the individual state analyses which follow, all three of the regression weighting systems discussed above will be utilized.

Pennsylvania.

Pennsylvania is one of the seven states now utilizing an income factor in its state aid formula. Under the old (pre-1977) aid formula, property wealth was the sole measure of a district's fiscal capacity. Specifically, the former aid ratio (AR) consisted of the following formula:

$$AR_P = 1 - \frac{\text{District Market Value/District WADM}}{\text{State Market Value/State WADM}}(.50)$$

District market values were (and still are) determined by the State Tax Equalization Board.

In the summer of 1977, the Pennsylvania General Assembly passed a new aid formula. The new ratio consists of combining the property aid ratio (formulated above) with an income aid ratio. The income aid ratio is constructed in the following fashion:

$$AR_i = 1 - \frac{\text{District Personal Income/District WADM}}{\text{State Personal Income/State WADM}}(.50)$$

Income data is collected from the Personal Income Tax Bureau of the Pennsylvania Department of Revenue and is available on a district basis.

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[16] WADM = weighted average daily membership

From the separate property and income aid ratios described above, an overall aid ratio is constructed by taking 60% of the property aid ratio and adding it to 40% of the income aid ratio. In other words,

$$AR = .60\ AR_p + .40\ AR_i$$

This aid ratio is then multiplied by what is called the "Base Earned for Reimbursement" to determine the actual aid amount.[17]

Several additional points should be made about the new state aid formula. In the first place, it appears that the 60-40 weights associated with property and income are the result of political compromise in the Pennsylvania General Assembly, rather than the result of the determination of the actual importance of revenue and property in district spending behavior. Secondly, although Act 59 was passed in 1977, full funding has not yet occurred.

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[17] The "Base Earned for Reimbursement" is determined as the smaller of either:

a) The district's actual instructional expense per weighted average daily membership;

or

b) The amount earned through tax effort, calculated as follows:

1. Where the district's equalized millage is 30% or more above the state's median equalized millage, the base earned shall be the state's median actual expense per statewide weighted average daily membership.
2. Where the district's equalized millage is 15% but less than 30% above, the amount shall be $50 less.
3. Where the district's equalized millage is less than 15% above or 15% below, the amount shall be $100 less.
4. Where the district's equalized millage is 15% to 30% below, the amount shall be $150 less.
5. Where the dsitrict's equalized millage is more than 30% below, the amount shall be $200 less.

For the purpose of deriving the regression-based weights for Pennsylvania, the 1975-76 school year was analyzed. As of this year, Pennsylvania contained 505 school districts. All but one of these districts were included in estimating the basic equation (1) specified above.[18] The results are summarized in Table 3.[19] It should be noted that three alternative specifications of the basic equation have been run: (a) with the variables expressed in dollar form; (b) with the variables expressed in standard deviation units; (c) and with the variables expressed in natural logarithm form.

As can be seen from Table 3, the coefficients of both the income and property variables are highly significant ($\alpha = .01$ or less) in all three equations. It is the difference in the magnitudes of the coefficients, however, which is important for ascertaining the appropriate weights. Under the assumption that the percentage weights are directly proportional to the magnitude of the regression coefficients, the percentage weights for income and property (W_i and W_p) in an additive measure of fiscal capacity may be calculated as follows:

$$\frac{\text{Reg. Coeff.}_i}{\text{Reg. Coeff.}_p} = \frac{W_i}{W_p}$$

subject to the constraints that $W_i + W_p = 1.0$
and W_i and W_p are each ≥ 0

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[18] Bryn Athyn Boro S.D. was excluded because of suspected errors in the data.

[19] It is interesting to note that the correlation between income per WADM and property per WADM is somewhat higher in Pennsylvania ($r = .53$) than for most of the other states analyzed. (See Table 1, Chapter I). Still, it is not so high that the problem of multicollinearity appears to be serious.

Table 3

Regression Coefficients, Pennsylvania, 1975-76[1]

Dependent Variable	Constant	Inc. per WADM	M. Val. per WADM	$\overline{R}^2$
	Partial Regression Coefficients[2]			
(1) Loc. Rev. per WADM	-39.754	.0151**	.0175**	.71
	(22.267)	(.0015)	(.0008)	
	Standardized Regression Coefficients (β's)			
(2) Loc. Rev. per WADM (std.)	0	.2925**	.6471**	.71
	Natural Logarithm Regression Coefficients			
(3) Loc. Rev. per WADM (ln)	-5.815	.4331**	.7967**	.83
	(.276)	(.0381)	(.0283)	

[1] n = 504 districts

[2] Standard errors in parentheses
* = significant at 5% level, two-tailed t-test.
** = significant at 1% level, two-tailed t-test.

Explanation of terms: Loc. Rev. = Total general fund revenues of school districts from local sources.
Inc. = Total income of taxpayers in district.
M. Val. = Market valuation of property.
WADM = Weighted average daily membership.

The results have been listed in Table 4 for each of the three specifications of the regression equation. The percentage weights based on the partial regression coefficients (with the data in dollar terms) are .46 for income and .54 for property, while the property weights tend to be somewhat higher (.69 and .65) for both the standardized and the logarithmic regressions.

Most importantly, it should be noted that in all three cases the weights associated with property exceed the weights associated with income. Quite interestingly, the empirically-derived weights do not differ appreciably from the 60-40 weights currently used in the new Pennsylvania aid formula.[20]

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[20] A number of school districts in Pennsylvania are characterized by extremely high or extremely low values of property and/or personal income per student. These "outlyer districts" do not all lie on the same general trend line as that the more typical districts when values of income per WADM or property per WADM are plotted against local revenues per WADM. This suggests that our assumption of a linear relationship between the two measures of district wealth and local revenues per student may not be justified.

Because of this possibility, along with the desire to look at a more homogeneous sample of Pennsylvania districts, we analyzed a modified sample of districts consisting only of districts whose income per WADM and market value per WADM fell within the 5th and the 95th percentiles of all Pennsylvania school districts. The weights for this modified sample of districts did not differ appreciably from the weights for the entire (n = 504) population of districts. This was generally true for the other three states analyzed here as well, so no further discussion will be offered.

Table 4

Percentage Weights for Income and Property, Derived from 1975-76 Pennsylvania Regressions[1]

	W_i	W_p
(1) Basic regression (data in $)	.463	.537
(2) Standardized regression (data in standard units)	.311	.689
(3) Logarithmic regression (data in natural logarithms)	.352	.648

[1] n = 504

Minnesota

Minnesota has been selected as a second state to investigate regarding alternative measures of fiscal capacity. As in the case of Pennsylvania, Minnesota's system of school financing has undergone significant recent changes. In fact, Minnesota was the first state to enact significant school finance reform in the seventies by drastically raising the level of foundation support. In 1971, a suit was initiated in federal court which charged that the existing Minnesota school finance system was unconstitutional. The timing of the suit corresponded closely with that of the more famous Serrano case in California. In November of 1971, however, Governor Wendall Anderson signed a new school finance and tax relief bill, and the court case was later dropped.[21]

The new Minnesota aid formula is a foundation plan, as was the old formula. The guaranteed foundation level, however, has been raised appreciably--by nearly 50% from 1971 to 1972.[22] Other important aspects of the reform included an attempt to control total district resources through "levy limits," with a 30 mill tax rate being the maximum permissable levy (subject to some exceptions). Beginning in 1978, Minnesota is one of the few states now recapturing a portion of the excess revenues collected by school districts taxing at the maximum levy.[23] The measure of district fiscal capacity currently in use in the Minnesota system is that of total adjusted property valuation as adjusted by the state's Equalization Aid Review Committee (EARC) for variations in assessment practices.

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[21] Phillip Vincent and Kathleen Adams, op. cit., p. 8.

[22] In 1975-76, the guaranteed foundation level stood at $900 per pupil unit for grades 1-6 and $11,260 for grades 7-12.

[23] Allen Odden, School Finance Reform in the States: 1978 (Denver: Education Commission of the States, 1978), p. 7.

Although the current Minnesota fiscal capacity measure includes only equalized property values, we shall attempt to estimate the weights which would be given to income and property if the measure were altered to include an income component. As is the case of Pennsylvania, we shall use multiple regression analysis to estimate the linear combination of income and wealth which best explains the actual spending practices of the districts in question. Along with the raw values of the net regression coefficients, we shall also calculate the regression coefficients for the data expressed in both standard deviation and logarithmic form.

In Table 5 have been listed the results of the three basic estimating equations. As was true for Pennsylvania, the coefficients of both the income and property variables are positive and highly significant in each of the three equations.[24] The adjusted R^2 values indicate that about fifty percent of the variation in local expenditures per pupil have been explained by the regression equations.

In Table 6, each pair of regression coefficients has been converted into a set of percentage weights for income and property wealth, respectively. As in the case of Pennsylvania, the weights to be accorded property per pupil are significantly higher than those for income per pupil. If income were to be included in the Minnesota measure of school district capacity, the most appropriate weighting system (based on school district expenditure behavior) would carry weights of roughly 75-80% for property and 20-25% for income. It will be noted that the weight given to district income is somewhat lower than in the case of Pennsylvania.

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[24] The zero order coefficient of correlation between income per pupil and property per pupil is .32.

Table 5

Regression Coefficients, Minnesota, 1975-76[1]

	Partial Regression Coefficients[2]			
Dependent Variable	Constant	Inc. per Pup.	Prop. per Pup.	$\bar{R}^2$
(1) Loc. Exp. per Pup.	143.339** (25.063)	.005** (.0015)	.019** (.0012)	.44
	Standardized Regression Coefficients (β's)			
(2) Loc. Exp. per Pup. (std.)	0	.1378**	.6073**	.44
	Natural Logarithm Regression Coefficients			
(3) Loc. Exp. per Pup. (ln)	-.249 (.362)	.179** (.044)	.497** (.032)	.51

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[1] n = 435 districts (entire population)

[2] Standard errors in parentheses
* = significant at 5% level, two-tailed t-test.
** = significant at 1% level, two-tailed t-test.

Explanation of terms: Loc. Exp. = Locally derived expenditures.
Inc. = Total personal income in district.
Pup. = Resident pupil units.
Prop. = Equalized value of property as determined by state EARC.

Table 6

Income and Property Weights, Derived from 1975-76 Minnesota Regressions[1]

	W_i	W_p
(1) Basic regression (data in $)	.208	.792
(2) Standardized regression (data in standard units)	.185	.815
(3) Logarithmic regression (data in natural logarithms)	.265	.735

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[1] n = 435 districts

Ohio

Ohio, like Minnesota, is a state which has recently enacted reforms in its school finance program. The Ohio reform, however, consisted of adding a guaranteed yield plan to its foundation program while raising the guaranteed foundation level. Ohio still uses property valuation per pupil as the measure of local ability to support schools. Property assessment ratios are used to adjust for inter-district differences in assessment practices. Currently, however, Ohio (along with a number of other states) is considering the possibility of modifying its aid program by including an income factor in its measure of district fiscal capacity.[25]

As in the cases of Pennsylvania and Minnesota before, we shall estimate the linear combination of income and property which best explains (via least squares regression) the actual spending practices of the individual school districts. In Table 7 the results of the basic regression equation have been listed for the year 1977-78. As can be observed in the table, the coefficients of both the income and property terms are positive and highly significant in all three basic equations. (There is no evidence of multi-collinearity, with the coefficient of correlation [r] between income and property only .16). From approximately 68% to 82% of the total variation in local revenues per pupil has been explained by the estimating equations.

When the regression coefficients in Table 7 are converted into percentage weights (see Table 8) a now familiar pattern emerges. In the case of all three weighting schemes, the weight for property wealth

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[25] Allen Oden, School Finance Reform in the States, op. cit., p. viii.

Table 7

Regression Coefficients, Ohio, 1977-78[1]

Dependent Variable	Constant	Inc. per Pup.	Eq. Val. per Pup.	R^2
	Partial Regression Coefficients[2]			
(1) Loc. Rev. per Pup.	225.593** (17.814)	.0024** (.0005)	.015** (.0004)	.68
	Standardized Regression Coefficients (β's)			
(2) Loc. Rev. per Pup. (std.)	0	.118**	.800**	.76
	Natural Logarithm Regression Coefficients			
(3) Loc. Rev. per Pup. (ln)	-4.654** (.225)	.224** (.023)	.869** (.021)	.82

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[1] n = 611 districts (5 districts were omitted because of incomplete data)

[2] Standard errors in parentheses
* = significant at 5% level, two-tailed t-test.
** = significant at 1% level, two-tailed t-test.

Explanation of terms: Loc. Rev. per Pup. = Local operating revenue per pupil.
Inc. per Pup. = Average (per pupil) federal adjusted gross income reported on 1976 Ohio income tax returns.
Eq. Val. per Pup. = Equalized value of personal property per pupil.

Table 8

Income and Property Weights, Derived from 1977-78 Ohio Regressions[1]

	W	W_p
(1) Basic regression (data in $)	.134	.866
(2) Standardized regression (data in standard units)	.130	.870
(3) Logarithmic regression (data in natural logarithms)	.222	.778

[1] n = 611 districts

considerably exceeds the weight for income. Here, the property weight averages approximately 85%, while the income weight averages only about 15%. Property per pupil appears to be the principal determinant of the level of locally-derived expenditures per pupil in the state of Ohio.

Kansas

As in the case of the previous three states studied, Kansas has also experienced recent reforms in its systems of educational finance. Prior to 1965, Kansas had a number of separate school aid plans (17 formulas for different purposes).[26] In this year, however, a foundation plan was instituted which consolidated many of the former aid plans. As a measure of local school fiscal capacity, an economic index was constructed which consisted of the sum of the adjusted assessed property valuation plus the taxable income in the county of the school district. Kansas was thus one of the first states to broaden its measure of local district capacity to include some type of income component.[27]

Problems with the 1965 Act (not the least important of which was the use of a county index for local district aid purposes) led to appeals for reform and attacks in the courts. The result was a new law, the Kansas School District Equalization Act of 1973. The 1973 Act produced a guaranteed tax base, with each school district guaranteed the difference between its legally adopted budget and the amount produced by its local effort. Furthermore, in place of the previous county economic index the new law defined district wealth as the total valuation of taxable tangible property (adjusted to the statutorily required assessment ratio of 30 percent) plus the total of district resident income. The switch from county income to district income was made possible by a 1973 requirement that all Kansas taxpayers identify their resident school district on their state tax returns.[28] In a 1975 amendment, the definition of district fiscal capacity was altered once more to make fiscal capacity the average of property value and income for the most recent three years. The change had the effect of reducing the sharp annual fluctuations in state aid which had often resulted.[29]

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[26] For a thorough discussion and analysis of the Kansas school finance reforms, see Darwin Daicoff, "An Analysis of the Kansas School District Equalization Act of 1973," in Esther Tron, ed., Selected Papers in School Finance, 1976.

[27] Ibid., pp. 2-3.

In effect, the Kansas definition of district fiscal capacity as the sum of a district's income and property per pupil results in equal weights (unity) being assigned to income and property. As before, we shall attempt to derive empirically the set of weights for income and property which reflect the actual spending practices of the Kansas districts. The basic estimating equation specifies the local district budget per pupil (net of state aid) as a function of average adjusted valuation of property per pupil and average taxable income per pupil. The year analyzed was 1975-76.

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[28] *Ibid*., p. 7.

[29] The current Kansas definition of a local district's fiscal capacity (or wealth per pupil) is the four-year average of adjusted property valuation and resident taxable income in the district. The four year average represents a change enacted in 1976 by the Kansas legislature and replaced the previous three year average.

As can be seen from Table 9, once again the coefficients of both the income and property variables are of the expected sign and highly significant ($\alpha = .05$) as well.[30] However, for the basic regression equation (with data in dollar terms), the weight given to income (Table 10) exceeds that given to property by nearly a 2-1 ratio. For the standardized and logarithmic regressions, however, the property weight assumes the dominance which was observed for the case of the previous three states.[31]

A Theoretical Measure of Fiscal Capacity

The regression method of deducing appropriate weights for income and property is based on observing actual district spending behavior. As we have seen, it has yielded weighting systems which, for each of the four states analyzed, assign generally higher weights to property than to income.

As opposed to the previous method of deducing appropriate weights based on observed school district behavior, Walter McMahon has proposed a method of combining income and wealth to yield an *a priori* measure of school district fiscal capacity which is independent of school district spending behavior.[32] Realizing that property value is a stock and income

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[30] The simple correlation coefficient (r) between average adjusted valuation per pupil and average taxable income per pupil was .545 for the 1975-76 school year.

[31] There is reason to suspect that the weights for the income and property terms in the basic regression equation may be responding to the influence of a few unusually high (or low) income/property districts. When a sample of districts with incomes and property values between the 5th and 95th percentiles was selected and the weights were re-estimated for this sample, the income and property weights became approximately equal at 52% and 48% respectively.

[32] Walter McMahon, "A Broader Measure of Wealth and Effort for Educational and Tax Equity," *op. cit*.

Table 9

Regression Coefficients, Kansas, 1975-76[1]

Dependent Variable	Constant	Partial Regression Coefficients[2] Inc. per Pup.	Val. per Pup.	R^2
(1) Loc. Exps. per Pup.	77.100 (40.938)	.029** (.005)	.014** (.0005)	.81
	Standardized Regression Coefficients (β's)			
(2) Loc. Exps. per Pup. (std.)	0	.159**	.800**	.81
	Natural Logarithm Regression Coefficients			
(3) Loc. Exps. per Pup. (ln)	-3.620** (.233)	.231** (.030)	.790** (.016)	.93

[1] n = 307 districts (entire population)

[2] Standard errors in parentheses
* = significant at 5% level, two-tailed t-test.
** = significant at 1% level, two-tailed t-test.

Explanation of terms:

Term	Explanation
Loc. Exps. per Pup.	Budget per pupil minus state aid per pupil.
Inc. per Pup.	Three-year average of taxable income per pupil.
Val. per Pup.	Three year average of adjusted valuation per pupil.

Table 10

Income and Property Weights, Derived from 1975-76 Kansas Regressions[1]

	W_I	W_P
(1) Basic regression (data in $)	.674	.326
(2) Standardized regression (data in standard units)	.166	.834
(3) Logarithmic regression (data in natural logarithms)	.226	.774

[1] n = 307 districts

a flow measure, McMahon has utilized a way of combining the two into a single measure. The procedure is based on a method first suggested by Burton Weisbrod and W.L. Hansen[33] and consists of converting property into an income flow or "annuity" per period.

According to this line of reasoning, property in a district may be used (at least potentially) to purchase an annuity, which in term would yield a periodic payment R for a certain number of years. The periodic payment R (which may be considered to consist largely of imputed income) may then be added to current income in the district to yield a single income-flow measure. This income measure, it may be argued, is a more comprehensive measure of a district's ability to finance education than either property or income alone.

Alternatively, McMahon argues that current income (from human and financial capital) may be capitalized over an appropriate time period to yield a stock term--the present value of current and expected future income. This stock term may then be added to the market value of property to obtain the total stock of wealth in a district--not just property wealth, but human and financial wealth as well. This more inclusive stock measure would also be superior to either current income or property value alone as a measure of a district's ability to pay. What McMahon has demonstrated, however, is that the above two income-property conversion methods are essentially equivalent under certain conditions inasmuch as they given the same relative weights to income and property.[34]

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[33] B. Weisbrod and W.L. Hansen, "An Income-Net Worth Approach to Measuring Economic Welfare", American Economic Review, vol. 58, 1968, pp. 13, 15-29.

[34] McMahon, op. cit.

Although either conversion method may be used, we shall use the first method--the property-to-an-income-flow conversion--to derive a set of weights[35] for the four states analyzed here. Basically, the method consists of specifying "adjusted" income at time t (I_t*) as being the sum of current income (I_t) plus RP_t where P_t is the market value of property and R is the "conversion factor".

$$I_t^* = I_t + RP_t$$

The conversion factor itself is merely the periodic payment of an annuity certain whose present value is $1. For the purposes of specifying R, information regarding the interest rate and the term of the annuity is required. Although a case might be made for a number of interest rates, we shall use 7% as a not unrealistic rate. (McMahon is somewhat more conservative in selecting a 5% rate.) As far as the term of the annuity is concerned, McMahon has chosen the expected remaining lifetime of the average taxpayer in a school district. Since the average age of persons over 21 is 44 years of age, and since "the life expectancy of a 44 year old tax payer is 28 years," McMahon has chosen 28 years as the term of the annuity.[36] A brief check of census life tables, however, has found that the average life expectancy of a 44 year old person is actually 30.99 years, rather than 28 as noted by McMahon.[37] Therefore, we shall use 31 years as the term of the annuity.

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[35] The following paragraphs parallel the McMahon analysis very closely.

[36] McMahon, op. cit.

[37] Ibid.

The value for R, the periodic payment of an annuity, is easily solved by the basic annuity formula[38]:

$$R = \frac{A\ (i)}{1 - (1 + i) - n}$$

where A = the present value of the anuity

i = the interest rate

n = the number of payment intervals

Assuming an interest rate of 7% (with annual compounding), 31 payment intervals, and a present value of $1, R can be found to be equal to .08.[39] In other words, if a more comprehensive (flow) measure of ability to pay is to be constructed from current income and property wealth, the appropriate "weight" to be given to property is .08. Current income, with a weight of 1, would thus be counted with a weight more than 12 times that of property. This, of course, is very much in contrast to the relative weights derived empirically in the previous section.

Summary and Conclusions: Alternative Wealth Measures

In the previous sections we have been concerned with several ways in which measures of school district fiscal capacity might be broadened to include an income factor. Essentially, the problem was to deduce a reasonable system of weights for income and property. Two alternative approaches were used: 1) an empirical approach, according to which the weights accorded income and property reflected the actual spending practices of the districts in a given state; 2) a theoretical approach, according to which income (a flow measure) and property (a stock measure) could be combined into a single measure which would better reflect a district's ability to pay.

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[38] F. Ayres, Mathematics of Finance (New York: McGraw-Hill, 1963), p. 81

[39] The R calculated by McMahon for $i = .05$ and $n = 28$ was .067.

The results of the two approaches were strikingly different. For the four states whose district spending habits were analyzed for the purpose of deducing the empirical weights, the weights accorded property usually averaged 60-80%, while that accorded income averaged only about 20-40%. For the most part, the relative weights remained in this range regardless of the state analyzed or the weighting scheme used. Only for one state (Kansas) did the income weight exceed the property weight, and only for one of the weighting schemes at that.

In contrast with the empirically-based weighting system, the theoretically deduced "McMahon weights" gave income the heavier weight. The property conversion factor R was only .08 (compared to the weight of unity for current income.) Moreover, the weight for property appeared to be fairly insensitive to the choice of the interest rate and the period of payment. (McMahon's R value of .067 was based on a 5% interest rate and a 28 year payment period, as opposed to our .07 interest rate and 31 year period.)

It is difficult at this stage to argue which one of these weighting systems is "superior." Each has its shortcomings. The empirically-based system is subject to the criticism that it is essentially based on how the "average" system reacts to its income and property wealth in its school expenditure decision. As such, it does not explicitly take into account the extent to which differences in district educational preferences may have altered spending. Moreover, although we have attempted to isolate revenues (expenditures) from local sources to examine their responsiveness to changes in income and property wealth, we have made no allowance for how the spending is affected by state aid. In other words, we have ignored the possibility of a Feldstein "price effect" influencing the level of local spending.[40]

The McMahon conversion method of wealth measurement is not without its shortcomings also. Besides the arbitrariness of the discount rate and the annuity period selected, there is also the question of how to treat the various types of property (commercial, residential, industrial). It may be unrealistic to suppose that a single interest rate and period should be applied to each.

Despite their shortcomings, however, it can be argued that both weighting systems have a sound logical basis. In this sense, they may at least be preferable to narrower measures of fiscal capacity with either exclude income entirely or which use a weighting system which reflects political compromise, ignorance, or a flip of the coin (or all three).

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[40] Martin Feldstein, "Wealth Neutrality and Local Choice in Public Education," American Economic Review, 65 (March, 1975), pp. 75-89.

CHAPTER III

The Effects of Various Alternative Fiscal Capacity Measures

The question of the relative weights to be given to income and property in a broader measure of fiscal capacity is a significant one. In the previous chapter we have derived several alternative weighting schemes based on both logic and observed behavior. Several important questions remain, however, regarding the effects which a revision of current measures of fiscal capacity would bring about. Specifically, how would the various alternative measures affect the relative rankings of fiscal capacity of school districts in the states studied? Would these alternative capacity measures reflect greater or lesser relative variation in fiscal capacity? How would these effects differ according to the size and geographic location of the school district? Finally, what differences in state aid would be forthcoming to the various districts should these alternative wealth measures be adopted? Would greater equalization of expenditures per student result? These are among the questions which shall be analyzed in the sections to follow.

Previous Studies

The relationship between alternative local fiscal capacity measures and school finance equity has been discussed frequently but seldom analyzed empirically.[1] In one of the few studies conducted to date, Hou estimated the impact of several alternative local fiscal capacity measures in Illinois.[2] Hou's fiscal capacity measures consisted of various types of income factors applied as weights to assessed property valuation.[3] (He made no attempt to rationalize the selection of his weighting systems.) The distribution of state aid under various measures of local fiscal capacity was then simulated by substituting each alternative local fiscal capacity measure into the existing Illinois state aid formula. Hou found that his per TWADA income weighting was the best of the weighting systems he used for the purposes of moving toward greater fiscal neutrality.

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[1] Thomas Melcher, "School Finance Equity Effects of Alternative Local Fiscal Capacity Measure," Paper presented at the Fourth Annual Meeting of the American Education Finance Association, Washington, D.C., January 15, 1979.

In his previously noted paper, Walter McMahon[4] utilized a broader wealth measure which added the capitalized flow of income to property wealth. Using this measure for Illinois, McMahon showed that at various foundation levels his broader measure of wealth had the effect of improving the targeting of state aid to the lower expenditure-per-pupil schools.

In a very recent study, Thomas Melcher analyzed the equity implications of using alternative local fiscal capacity measures in the state school finance system recommended by the North Carolina Governor's Commission on School Finance.[5] (North Carolina, as of 1978, still uses a basic flat grant system of state aid.) Melcher used eight different local fiscal capacity measures and found that the implementation of a fiscal equalization program based on any of his selected capacity measures would reduce the extent of resource disparity (as measured by various statistics such as the coefficient of variation) within the state of North Carolina.[6] He further claimed that the use of any of his fiscal capacity measures would be more consistent with principles of ex post fiscal neutrality. Specifically, the Pearson product-moment correlation coefficient between revenue per unit and local fiscal capacity was lower in his simulated revenue distributions than in the actual 1976-77 revenue distribution in North Carolina.[7]

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[2] J.D. Hou, "Effects of Various Income Weightings on the Distribution of Illinois State Aid to Education," in J.M. Cronin, ed., Alternative Measures of Wealth and Effort (Springfield, Illinois: Illinois Office of Education, 1977).

[3] The four weightings used by Hou were: a per capita income weighting, a median family income weighting, an aggregate income weighting, and a per TWADA income weighting (Ibid., p. 4)

[4] McMahon, op. cit.

[5] Melcher, op. cit.

In another recent study of note, Allen Odden[8] examined the effects of several alternative wealth measures in four states (Colorado, Connecticut, South Dakota, and Washington). Included among Odden's alternative measures was an adjustment of property values (per pupil and per capita) by the ratio of the district median family income to the state median family income. Odden found that the choice of measure clearly affected fiscal capacity rankings. Particularly, central cities seemed to be affected most by the choice of the wealth measure, with percentile rankings changing by as much as 50 percentage points. The fiscal capacity of individual suburban districts was also quite responsive to the specific wealth measure used. This, the striking variation in wealth rankings depending upon the choice of measure, was probably the most significant of Odden's findings.[9]

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[6] The eight alternative local fiscal capacity measures selected by Melcher were based on the major conceptual approaches found in the school finance literature and on the measures currently in use in some states. The measures consisted of: (1) tax base access per educational need unit, (2) tax base access per capita, (3) personal income per educational need unit, (4) personal income per capita, (5) tax base access plus income per educational need unit, (6) tax base access plus personal income per capita, (7) tax base access multiplied by a personal income factor per educational need unit, and (8) tax base access multiplied by a personal income factor per capita (Ibid., p. 32).

[7] Ibid., pp. 45-57.

[8] A. Odden, Alternative Measures of School District Wealth, op. cit.

When it came to simulating state aid under various fiscal capacity measures, Odden found that the use of the (multiplicative) income-weighted wealth measure had no predictable effect for central cities. In some cases it reduced state aid, and in some cases it increased it. In the case of suburban districts, the income-modified wealth measure would have generated less state aid. In the case of non-metropolitan areas, finally, the state aid level would have generally increased. Odden's sample, however, was restricted to an analysis of only a few dozen districts across the four states. Therefore, generalizations should be made in a cautious manner.

The Effects of Various Fiscal Capacity Measures

In the sections to follow we shall analyze the fiscal consequences of specifying district wealth in accordance with the various weights which were derived in the previous chapter for the four states constituting the focus of our study. Attention will first be directed to the variation in inter-district fiscal capacity under each of our measures. The inclusion of income as a significant (though not dominant) factor in the composition of a district's fiscal capacity might be expected to alter somewhat the relative degree of wealth inequality across districts.

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[9] *Ibid.*, p. 21.

Secondly, changes in the relative rankings of school districts by type of district will be analyzed. Stated simply, we shall address the question of whether the inclusion of an income factor to property wealth raises, lowers, or has no effect upon the fiscal capacity of the average urban, suburban, or rural district.

Finally, we shall attempt to simulate the changes in the level of state aid which would be forthcoming to the various districts in the states should the various alternative wealth definitions be utilized in the existing state aid formula. Of considerable interest here will be the fiscal neutrality consequences of such alternative wealth measures: i.e., whether the correlation between expenditures per student and the level of wealth per student would be lower under the alternative measures than under the current wealth measure.

Variation in Wealth Rankings under Alternative Fiscal Capacity Measures.

Before proceeding to examine the variation in district fiscal capacity under the alternative wealth definitions, it might be useful to review in Table 11 the income and property weights derived in Chapter II. For each state, we have derived four alternative sets of weights--three based on the regression analysis of local district spending behavior and the fourth based on the principle of converting property to an income

Table 11

Relative Weights Associated with Income and Property under Actual and Alternative Fiscal Capacity Measures

State	Current Measure	Basic Regression Measure	Standardized Regression Measure	Logarithmic Regression Measure	Property Conversion Measure
Pennsylvania					
Income Weight	.40	.46	.31	.35	1.00
Property Weight	.60	.54	.69	.65	.08
Ohio					
Income Weight	.00	.13	.13	.22	1.00
Property Weight	1.00	.87	.87	.78	.08
Minnesota					
Income Weight	.00	.21	.18	.26	1.00
Property Weight	1.00	.79	.82	.74	.08
Kansas					
Income Weight	1.00	.67	.17	.23	1.00
Property Weight	1.00	.33	.83	.77	.08

flow. As previously noted, the regression weights given income vary somewhat from state to state, but in nearly every case (except Kansas) the income weight is considerably lower than that for property. The property-conversion weighting method, however, gives income the dominant weight in each state. These differences in weights provide us with an opportunity to simulate and observe the fiscal consequences which would result as successively greater importance is attached to the income term in defining fiscal capacity. As the table shows, we have a fairly varied and continuous range of weights given to property and income across measures and across states.

In Table 12 are listed the results of applying the various alternative weighting systems which we have devised.[10] Specifically, we have simulated the wealth level for each school district in each of the four states analyzed in accordance with our weighting schemes. What Table 12 shows is how responsive the variation in district fiscal capacity is to each of these alternative measures of capacity. The two measures of variation selected are the coefficient of variation and the 95/5 percentile ratio. The coefficient of variation (the standard deviation divided by the mean) is a relative measure of variation which includes all districts in the population. As such, it is responsive to skewness and may be strongly affected by the presence of extremely high or low capacity districts. The 95/5 percentile ratio (simply the ratio

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[10] In Pennsylvania we have analyzed both the old, pre-Act 59 measure of fiscal capacity (Property per WADM) and the 60-40 weighted combination of property and income which is now being implemented.

Table 12

Variation in Fiscal Capacity Among Districts Under Current and Alternative Capacity Measures

State	Current Fiscal Capacity C.V.	Current Fiscal Capacity 95/5 Ratio	Basic Regression Measure C.V.	Basic Regression Measure 95/5 Ratio	Beta-Weighted Measure C.V.	Beta-Weighted Measure 95/5 Ratio	Logarithm-Weighted Measure C.V.	Logarithm-Weighted Measure 95/5 Ratio	Property Conversion Measure C.V.	Property Conversion Measure 95/5 Ratio
Pennsylvania			40.5%	3.16	43.2%	3.37	42.4%	3.31	37.3%	2.66
Pre-Act 59	49.2%	4.00								
Act 59	41.6%	3.28								
Minnesota	47.2%	4.64	42.7%	4.00	43.1%	4.04	41.7%	3.91	47.3%	3.13
Ohio	73.9%	4.16	69.6%	3.86	69.7%	3.87	67.6%	3.66	106.6%	2.78
Kansas	59.8%	4.79	52.8%	4.22	66.8%	5.91	65.9%	5.80	35.1%	3.01

Explanation of terms:

C.V. = Coefficient of variation (standard deviation ÷ mean)

95/5 Ratio = 95th percentile ÷ 5th percentile of the 95th percentile to the 5th percentile) is relatively inefficient inasmuch as it does not include all districts in the population--only the districts at these two percentiles. The ratio, however, is not responsive to the influence of a few extremely high or low observations. Together, both the coefficient of variation and the 95/5 ratio should provide a fair idea of how the inter-district dispersion of fiscal capacity is affected by the choice of capacity measures.

For the case of Pennsylvania, first of all, it should be noted in Table 12 that the variation in fiscal capacity under the old (pre-Act 59) measure of capacity (property per WADM) was considerably higher than that under the new 60-40 weighting scheme. Both the coefficient of variation and the 95/5 percentile ratio reflect this fact. Since the three regressions produced weights fairly close to the new 60-40 scheme now being implemented under Act 59, it is no surprise that the variation in district capacity is approximately the same for these measures. Interestingly, the property conversion (McMahon-weighted) measure produces the least variation among district capacity. All told, for the case of Pennsylvania, there is not much difference in the relative variability of fiscal capacity across districts, no matter which capacity measure is used. The average difference between the current Act 59 measure and all the alternative wealth measures is only about two percentage points.

For the cases of Minnesota and Ohio, the story is much the same. In Minnesota, first of all, the coefficient of variation for district wealth under the current wealth measure (property per pupil) is 47.2%

(1975-76). Under the three regression-based weighting schemes, the coefficient of variation drops slightly, while it stays the same for the property conversion weighting scheme. For Ohio, whose district wealth is also defined as property per pupil, there is considerably more variation in wealth per pupil across districts as measured by the coefficient of variation (73.9%). But the inclusion of income lowers only slightly the inter-district variation in fiscal capacity for the three regression-based measures. The extremely high coefficient of variation for the property conversion measure (106.9%) is the result of a few very high income-per pupil districts in Ohio. The 95/5 percentile ratio, it will be noted, is of a considerably lower order of magnitude.

The most sizeable differences in the variation of inter-district wealth levels is seen in the case of Kansas, although the order of magnitude of the differences is still rather small. The basic regression weighting scheme (with approximately a 67% weight given to income) results in a 7 percentage point decline in the coefficient of variation vis-a-vis the current income plus property measure of fiscal capacity. The beta and log-weighted schemes, however, (which give only about a 20% weight to income) result in a 6-7% rise in the coefficient of variation. The property-conversion wealth definition produces the lowest relative variation across districts of all the weighting schemes.

On the basis of the above comparisons, the major conclusion which can be drawn is that the inclusion of income generally seems to reduce the variation in fiscal capacity across districts. The heavier the weight accorded income, the lower (usually) the variability. It should be stressed, however, that the magnitude of the decline in the coefficient of variation is not very large. To use the case of Minnesota as an example, the assignment of a roughly 20% weight to income per pupil (as in the case of either of the three regression-based weights) would result in a decline of only 4-5 percentage points in the coefficient of variation in district wealth. In percentage terms, this corresponds to a decline of less than 10% in the coefficient of variation. Only the property-conversion weighting scheme seems to possess the potential for effecting a sizeable alteration in the variability of inter-district wealth.

The fact that the decline in variability should be so slight may at first seem surprising. However, one should remember that the order of magnitude of property (per student) is itself considerably greater than that of income (per student). In the states analyzed here, the value of property per pupil ranges from 2 to 4 times higher than income per pupil. Consequently, a 20% weight associated with a term (income per pupil) which is again only perhaps 20-30% as large as the term to which it is added (property per pupil) would seem to possess a somewhat limited capability for altering the already-existing fiscal capacity structure.

Changes in Fiscal Capacity by District Type

Even though the overall variation in district wealth did not seem to be significantly altered by the wealth measure used, it does not preclude the possibility that more considerable differences might be found for certain types of districts. Therefore, in this section we have simulated the fiscal capacity of school districts in each of four states with the districts classified by geographical/population status. Although there are many classification schemes which could be used, we have utilized a typology similar to the one used by J. Dan Hou.[11] Specifically, each school district was placed in one of the following four categories:

1. Central city districts: those school districts serving the central city (or cities) in a standard metropolitan statistical area (SMSA);
2. Suburban school districts: those school districts located within an SMSA but outside the central city;
3. Small urban (non-SMSA) districts: those districts located in a non-SMSA city with a 1970 population of at least 10,000;
4. Rural: all other school districts (non-SMSA, non-urban).

In the pages which follow, we have simulated the wealth levels which would result should fiscal capacity be redefined in accordance with the various weights derived for each state in Chapter 2. Differences in wealth levels by type of district as defined above will be noted.

Pennsylvania

In Table 13, we have estimated the average (median) fiscal capacity for each of the four major geographical types of school districts noted above. Since the orders of magnitude of the various measures of fiscal

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[11] Hou, op. cit., p. 5.

Table 13

Fiscal Capacity by Type of School District, Pennsylvania, 1975-76

Type of District		Current Measure		Basic Regression Measure		Beta-Weighted Measure		Log-Weighted Measure		Property Conversion Measure	
		Median	Index	Median	Index	Median	Index	Median	Index	Median	Index
Rural	(pre-Act 59)	$16,593	78	$14,952	81	$15,569	80	$15,321	80	$13,771	81
	(post-Act 59)	15,145	80								
Small Urban (non-SMSA)	(pre-Act 59)	19,915	93	17,292	93	18,130	93	17,965	94	16,770	99
	(post-Act 59)	17,766	94								
Suburban (SMSA)	(pre-Act 59)	24,561	115	20,770	112	22,021	114	21,782	114	18,899	111
	(post-Act 59)	21,381	113								
Central City (SMSA)	(pre-Act 59)	23,740	111	21,005	113	21,903	113	21,661	113	18,415	108
	(post-Act 59)	21,377	113								
District Medians	(pre-Act 59)	$21,329	100	$18,541	100	$19,392	100	$19,176	100	$17,012	100
	(post-Act 59)	18,484	100								

capacity vary somewhat, index number values have also been calculated. It should be stressed, therefore, that in comparing the relative fiscal capacity rankings of various types of districts across the fiscal capacity measures, the index number values (and not the medians) should be utilized. For the "current" fiscal capacity measure in effect in Pennsylvania, we have calculated both the property per WADM measure which was the measure in 1975-76 and the 60-40 weighting scheme for property and income which has been in effect since Act 59 was passed in 1977.

The variations by school district type and capacity measure are clearly indicated by a comparison of the index number values. As can be seen, according to both the old measure of fiscal capacity (property per pupil) and the Act 59 measure, suburban and central city districts had the highest average fiscal capacity, followed by smaller (non-SMSA) urban and rural districts.

Interestingly, the 60-40 fiscal capacity measure has appreciably altered neither the order nor the dispersion of average fiscal capacities across district types. Since the weighting schemes which were derived from our three regression equations produced weights very close to the 60-40 scheme now in effect under Act 59, it is not surprising to observe that there is little difference in district capacity rankings for these alternative measures. When the property-as-an-income-flow weighting method is used, the variation in fiscal capacity is lessened slightly--with the average rural and small urban district capacities rising and the suburban and central city average dropping slightly. The compression, however, is very small. We are, therefore, led to conclude that neither the level nor the ranking of the average Pennsylvania fiscal capacity would be significantly altered under any of our alternative fiscal capacity measures.

Minnesota

Minnesota, it will be remembered, currently uses equalized property value per pupil as its definition of fiscal capacity. As an examination of Table 14 will point out, the average fiscal capacity of districts by type in Minnesota is more strongly influenced by the particular capacity measure utilized than was the case for Pennsylvania. Under the current fiscal capacity measure, rural districts and small urban districts have the highest average valuation per pupil, with suburban districts lagging behind. This finding is not unexpected. As Allen Odden has pointed out[12], rural areas (with large areas of farmland and few pupils) may often rank high when property-based measures of fiscal capacity are used. In the case of residential suburbs, children of school age usually constitute a high percentage of the population. Consequently, residential suburban districts often rank low when property per pupil is the fiscal capacity measure used. Under the three regression-derived measures, however, with income given weights of approximately 20-25%, the rural district's average falls slightly while the suburban district average rises, and the gap between the two narrows somewhat. The fact that the fiscal capacity of the average residential suburban district is higher when an income weight is added largely reflects the property-poor but income-rich "bedroom community" type of suburban area. This finding, it should be pointed out, is also consistent with other evidence.[13] Finally, the average relative fiscal capacity of the central city districts is seen to increase significantly under the regression-derived measures.

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[12] A. Odden, Alternative Measures..., op. cit., pp. 14 and 16.

[13] Ibid., p. 17.

Table 14

Fiscal Capacity by Type of School District, Minnesota, 1975-76

Type of District	Current Measure		Basic Regression Measure		Beta-Weighted Measure		Log-Weighted Measure		Property Conversion Measure	
	Median	Index	Median	Index	Median	Index	Median	Index	Median	Index
Rural	$16,388	106	$15,749	106	$15,878	106	$15,254	104	$12,629	97
Small Urban (non-SMSA)	14,825	96	15,447	105	15,454	104	15,559	106	19,211	147
Suburban (SMSA)	12,750	82	12,451	87	13,870	87	12,930	88	13,106	100
Central City (SMSA)	13,962	90	14,728	99	14,643	98	14,938	102	14,583	150
District Medians	$15,480	100	$14,810	100	$14,875	100	$14,618	100	$13,063	100

According to the property conversion measure, which is heavily dominated by income, the rural districts possess the lowest average fiscal capacity (as expected) followed in ascending order by suburban districts, small urban districts, and the central city districts. All in all, the Minnesota capacity rankings appear to be fairly strongly affected by the choice of fiscal capacity definition, with urban and suburban district fiscal capacities rising as income is weighted progressively more heavily, while precisely the opposite occurs for the fiscal capacity of the average rural district.

Kansas

Of the four states analyzed here, only Kansas has a considerable history with a fiscal capacity measure which includes income and property. Since fiscal capacity is specified as the simple sum of income and property per student, the Kansas measure in effect assigns equal weights to each.

As the index number values in Table 15 clearly show, the current fiscal capacity ranking by district type in Kansas is fairly similar to that observed in Minnesota. Rural districts rank highest in fiscal capacity, followed by small urban, suburban, and central city districts. Under all four alternative weighting schemes, there seems to be a tendency for the fiscal capacities of the small urban, suburban, and central city to rise moderately as progressively heavier weights are assigned to income (see Table 11 for the percentage weights corresponding to each measure). For the rural districts, exactly the opposite occurs, as the average fiscal capacity falls as income is more heavily weighted.

Table 15

Fiscal Capacity by Type of School District, Kansas, 1975-76[1]

Type of District	Current Measure		Basic Regression Measure		Beta-Weighted Measure		Log-Weighted Measure		Property Conversion Measure	
	Median	Index	Median	Index	Median	Index	Median	Index	Median	Index
Rural	$42,680	113	$17,020	112	$30,041	115	$28,446	115	$11,152	106
Small Urban (non-SMSA)	28,419	75	12,098	79	16,959	65	16,512	67	10,642	102
Suburban (SMSA)	24,133	64	10,204	67	15,057	58	14,586	59	7,407	75
Central City (SMSA)	21,279	56	9,120	60	13,628	52	13,176	53	7,141	68
District Medians	$37,738	100	$15,146	100	$26,060	100	$24,803	100	$10,473	100

[1] The general order of magnitude of the current average fiscal capacity level is considerably higher than that of the alternative wealth measures. This is because of the fact that the simple weights given to income and property under the current weighting scheme add to 2, while the percentage weights under the alternative fiscal capacity measures sum to 1. For this reason, the index number values of fiscal capacity levels should be used rather than the medians.

For the most part, the changes in the fiscal capacity index values are fairly modest over the span of the weights resulting from the regression analysis. Only in the case of the heavily income-dominated property conversion weighting scheme does the fall in the rural capacity index and the rise in the indices of the other three categories of districts become substantial.

Ohio

The measure of fiscal capacity currently in effect in Ohio is property per pupil. According to this measure, the average fiscal capacities of the districts rank (in ascending order) from rural, suburban, small urban, to central city districts, as can be seen by examining Table 16. Under the three alternative regression-based wealth measures (with income given weights of approximately 10-20%), virtually no change occurs in either the ranking or the level of the average district by geographic type. Only the property conversion weighting scheme produces any effect on the fiscal capacity levels, causing a modest rise in the fiscal capacity of suburban districts and slight declines in the average levels of the other three district types.

Conclusions: Changes in Fiscal Capacity by District Type

As we have seen in the previous sections, the average wealth rankings by type of district have varied across the states analyzed. Of course, the regression-derived weights given to income and property have differed from state to state, which accounts for part of the variation. Nevertheless, it is possible to observe some general similarities across the four states.

Table 16

Fiscal Capacity by Type of School District, Ohio, 1977-78

Type of District	Current Measure Median	Current Measure Index	Basic Regression Measure Median	Basic Regression Measure Index	Beta-Weighted Measure Median	Beta-Weighted Measure Index	Log-Weighted Measure Median	Log-Weighted Measure Index	Property Conversion Measure Median	Property Conversion Measure Index
Rural	$23,709	89	$22,356	89	$22,396	89	$21,453	89	$15,334	86
Small Urban (non-SMSA)	29,708	112	28,555	114	28,590	114	27,660	115	19,176	107
Suburban (SMSA)	26,733	101	25,564	102	25,596	102	24,788	103	19,155	107
Central City (SMSA)	31,771	120	29,988	120	30,041	120	28,817	120	21,008	117
District Medians	$26,520	100	$24,989	100	$25,046	100	$23,995	100	$17,915	100

For the rural districts first of all, the assignment of a moderate weight to income (as dictated by the regression weights) had a modest negative effect on the average rural district's fiscal capacity in two states (Kansas and Minnesota) and no effect in the two others (Ohio and Pennsylvania). However, the assignment of a dominant weight to income (via the property conversion measure) produced a more substantial reduction in the fiscal capacity of the average rural district in three of the four states. Only in Pennsylvania was there no change. This conclusion is quite consistent with the finding of Allen Odden that "nonmetropolitan areas generally rank highest in property wealth...and lowest in income."[14]

In three of the four states studied, there was a clear tendency for the average fiscal capacity of the urban non-SMSA districts to rise as income was assigned a progressively higher weight. Only in Ohio were the results erratic with respect to the fiscal capacity index for smaller urban areas. It should be noted, though, that the rise in the fiscal capacity index was quite small for two of the states (Pennsylvania and Kansas). Only in the case of Minnesota was there observed a pronounced rise.

With respect to the suburban districts, there was also a tendency for the fiscal capacity index to rise moderately in three of the four states as district income received a progressively higher weight. Only in Pennsylvania was there essentially no change. This finding is again consistent with Odden's observation that "suburbs appear to be poorest...when an income modification is not made."[15]

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[14] A. Odden, Alternative Measures..., op. cit., p. 16.

[15] Ibid., p. 17.

For the case of the central city districts finally, no clear pattern emerges. In the case of two states (Pennsylvania and Ohio), the inclusion of a moderate weight for income caused little or no change in the central city fiscal capacity index. A heavy weight for income, in accordance with the property conversion scheme, produced a modest decline in central city districts' average fiscal capacity in both Pennsylvania and Ohio. In the case of the other two states, however, there was a tendency for the relative fiscal capacity index of central city districts to rise with progressively heavier weights for income. The responsiveness of the fiscal capacity index was only moderate in Kansas but quite large for Minnesota.

Overall, however, it is clear that the effects of adding income to a measure of fiscal capacity will vary depending on the state and type of district studied. Nevertheless, there seems to be a general (though not universal) tendency for the average fiscal capacity of rural districts to decline and the average fiscal capacity for small urban and suburban districts to rise as progressively heavier weights are assigned to income. It should be kept in mind that the conclusion above refers only to the average district. We have not considered the existence of substantial variation within district classification categories.

State Aid Simulations

The wealth simulation exercises of the previous section are revealing. In general, the effects of including income with a moderate weight into our fiscal capacity measure have been to lower slightly the average fiscal capacity of rural districts and to raise slightly the average fiscal capacity of the three other district types. Within the context of fiscal neutrality, however, it is interesting to ascertain the magnitude of the changes in the amount of state aid which would be forthcoming to various types of districts should the fiscal capacity levels be altered in accordance with our various alternative weighting schemes.

The principle of fiscal neutrality has emerged during the 1970's as a standard of equity in school finance circles. According to the Supreme Court's Rodriquez decision, the principle of fiscal neutrality requires that the quality of public education may not be a function of wealth of the school district. The Court, however, left no operational definition of fiscal neutrality so the definition is still open to varying interpretations, both in later court decisions and in the school finance literature as well.

A useful distinction that has emerged concerning fiscal neutrality is that of ex ante vs. ex post fiscal neutrality. As Stephen Barro has stated: "The ex post interpretation is that the actual level of educational support must not correlate with wealth...The ex ante formulation is that the ability of a district to support schools should not depend on wealth."[16] By Barro's definition, ex post fiscal neutrality is attained when the coefficient of correlation (or another appropriate measure of association) between total district spending and district wealth (or fiscal capacity) is zero. This is the definition of fiscal neutrality which will be utilized here.

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[16] Stephen Barro, "Alternative Post-Serrano Systems and their Educational Implications," in John Pincies, ed., School Finance in Transition (Cambridge, Mass.: Bellinger Pub. Co., 1974), p. 32.

There are several statistical problems which come into play, however, when attempting to simulate the amount of state aid which would be forthcoming under alternative measures of wealth. The principal problem is that the parameters of the state aid or subsidy formula currently in use in any state are closely tied to the wealth measure itself. Consequently, if the wealth measure is altered, it can be expected that the subsidy formula will also be altered. Otherwise (again depending upon the specific wealth measure), it is possible that total state aid might either rise or fall to unrealistic levels. A good case in point is Kansas. Under the wealth definition currently in use (the simple sum of income per pupil and property per pupil), the mean wealth for all Kansas districts for 1975-76 was approximately $44,000 per pupil. But according to the weights based on our regression beta-coefficients, for example, the mean wealth per pupil was only about $30,000.[17] Consequently, if the alternative wealth definition were utilized without altering the subsidy formulas, a huge increase in total state aid for nearly all districts would result. Such an event is highly unlikely to occur. Instead, there would be changes made in the basic subsidy formula.

In previous simulation research involving state aid simulations, some investigators have simply utilized a hypothetical subsidy formula. Allen Odden, for example, simulated state aid under alternative wealth measures for the states of Colorado, Connecticut, South Dakota, and Washington.[18] Odden ignored, however, the different subsidy programs currently in effect in these states and instead simulated aid under a guaranteed tax base subsidy plan.

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[17] The principal reason for the discrepancy here is the fact that the sum of the weights under the current Kansas wealth definition is 2, whereas the sum of the percentage weights based on the regression coefficients is 1.

[18] A. Odden, Alternative Measures of School District Wealth, op. cit.

In the simulation exercises below, we shall utilize the actual subsidy formula in simulating levels of state aid under alternative wealth definitions. Where necessary, however, we shall alter the subsidy plan parameters in order to keep the general order of magnitude of the average wealth levels (and hence the total amount of state aid distributed) approximately the same.

Kansas Aid Simulations

The subsidy plan in effect in Kansas in 1975-76 (and, with some modifications, in effect at the current time) is based upon the concept of power equalization. Each district is guaranteed a budget limit which, in turn, is based upon its enrollment category (three general classifications) and its "local effort rate." The state share of the budget is a residual amount--the difference between the legally authorized general fund budget and the "local effort" of the district.[19] (For a fuller explanation of the mechanics of the Kansas subsidy scheme, the reader is referred to the sources in footnote 20 below.)

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[19] "Local effort" under the Kansas Act is defined as the sum of:

a) local wealth of the district (the sum of district income per pupil and property per pupil) times the district local effort rate (.017 times the ratio of the district's budget per pupil to the budget per pupil "norm" for the district's enrollment category);
b) the previous year's receipts from federal impact aid (P.L.874);
c) the district's share of the county school foundation fund.

[20] See Esther Tron, ed. Public School Finance Programs, 1975-76 (Washington: U.S. Office of Education, 1976). Also, Darwin Daicoff, "An Analysis of the Kansas School District Equalization Act of 1973," in E. Tron, ed., Selected Papers in School Finance, 1976 (Washington: Office of Education, 1976).

In simulating changes in the level of state aid per district, we have first estimated the level of each district's state subsidy per pupil under the current definition of district wealth (the sum of district income per pupil and property per pupil). In doing so, we have excluded that part of a district's "local effort" which consists of receipts from federal impact aid and from the county school foundation fund (see footnote 19). We next calculated the amount of the subsidy which would be forthcoming to each district under each of our four alternative wealth measures.[21] The differences between the "alternative wealth measure" subsidy levels and the "actual wealth measure" subsidy levels are given in Table 17. (A negative sign refers to a decrease in the subsidy should the corresponding alternative wealth measure be utilized.) The entries in the table represent the median (dollar and percentage) change in the level of state aid per pupil by each of the four district types.

As can be seen from the table, the simulated changes for the basic regression equation weighting scheme are usually fairly small. Although the average state subsidy paid to rural districts would rise slightly ($8 per pupil), there would be average declines of from $10 to $45 for districts in the other three classifications. It might be noted that these simulated changes in state aid are quite consistent with the changes in the relative wealth rankings simulated in Table 15. There it was observed that, under the basic regression weighting scheme, only the rural

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[21] Where necessary to maintain the general order of magnitude of the wealth levels, the local effort formula was adjusted to keep the local effort of the median district the same under all of the definitions.

Table 17

State Aid Simulations: Kansas, 1975-76
Median (Absolute and Percentage) Change in State Aid per Pupil Under Alternative Wealth Measures[1]

Type of District	Basic Regression Measure Change	Basic Regression Measure %	Standardized Regression Measure Change	Standardized Regression Measure %	Logarithmic Regression Measure Change	Logarithmic Regression Measure %	Property Conversion Measure Change	Property Conversion Measure %
Rural	$ 8	2%	-$12	-9%	-$ 5	-6%	$ 51	13%
Small Urban (non-SMSA)	- 41	-8%	41	8%	39	8%	- 162	-35%
Suburban (SMSA)	- 10	-2%	12	2%	14	2%	- 58	-10%
Central City (SMSA)	- 45	-8%	52	8%	53	8%	- 204	-36%

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[1] Changes calculated as the difference in the amount of state aid subsidy under alternative wealth measure relative to that amount simulated under current wealth measure.

districts would experience (on the average) a fall in their relative wealth levels (prompting an increase in aid). Average districts in the other three classifications would experience a rise in their relative wealth rankings which would generate a decline in state aid. It should be noted that the aid changes are not of a sizeable magnitude, however. The average general state aid per pupil in 1975-76 was $455,[22] which would make the simulated changes observed here on the order of 5-10%. As far as the other three alternative wealth measures are concerned, the changes in the level of state aid are of varying signs but also fairly small--with the sole exception of the property conversion weighting scheme. With the dominance which it gives to the level of district income, this scheme would bring about a very pronounced decline in aid levels to small urban, suburban, and central city school districts. Only in the case of rural districts would an increase ($51) in the per pupil subsidy occur.

Probably the most appropriate generalization which should be drawn from Table 17 is that if moderate variations in the relative weight given to income and property should be introduced in the 50-50 weighting scheme currently in effect in Kansas, the average change in the level of the state subsidy given to school districts would not be large.

Because of the peculiarities of the Kansas state aid formula, it is not possible to simulate the resultant changes in total district spending and thereby estimate the fiscal neutrality consequences of our alternative wealth measures. However, the coefficient of correlation between expenditures per pupil and district wealth as currently defined (income per pupil plus property per pupil) was +.83 for the 1975-76 school year. In other words, the current state aid system in Kansas is not fiscally neutral (in the ex post sense). There are two reasons why we would expect that a revision of the weights of the basic wealth measure along the lines suggested in the previous chapter would not lead to a pronounced change in the degree of fiscal non-neutrality, however. In the first place, the simulated changes in the level of state aid which would be forthcoming under our alternative schemes were small--averaging only about 5-10%. (The only exception was for the property conversion weighting scheme.) This finding, coupled with the fact that only about 40% of the general operating funds for Kansas schools were paid by the state during 1975-76, leads us to conclude that a revision of the weights would have little effect towards generating greater fiscal neutrality. Secondly, in Kansas it is the rural districts which have the highest wealth rankings under the current 50-50 wealth measure. And as we have seen in the previous section on wealth rankings, several of our alternative weighting schemes (the ones with higher income weights) would result in a decline in the relative fiscal capacities of these rural districts. The result, of course, would be even greater state aid and a movement further away from fiscal neutrality.

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[22] Daicoff, op. cit., p. 21.

Minnesota Aid Simulations.

The basic school support program in existence in Minnesota in 1975-76 (and, with some modifications, currently in effect today) is that of a foundation plan. In 1975-76, the program guaranteed a financing level of $900 per pupil unit, with a reduction for historically lower spending districts.

The detailed subsidy plan in effect for the year studied was as follows. The state share was set as the difference between the program calculation ($900 for most districts) minus the specified local share. The local share was in turn calculated as 30 mills times the adjusted assessed valuation of property.[23] The state share was further reduced by a portion of miscellaneous categorical aids.

In simulating changes in the average level of state aid per pupil per district, we have first estimated the level of each district's state subsidy per pupil under the current definition of district wealth (adjusted assessed valuation). To simplify the analysis, we have excluded deductions from the state share for categorical assistance. Furthermore, we have treated the program calculation as $900 for each district, thus ignoring the smaller program calculation for historically lower-spending districts.[24] Consequently, it should be remembered that the state aid levels which we use as bases for comparison are only "simulated actual" aid levels and are not necessarily equal to the true aid levels in effect for that year.

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[23] In the lower-spending districts, the local share was further adjusted by the ratio of the actual (sub $900) program calculation to $900. For further explanation on the details of the Minnesota foundation plan see E. Tron, Public School Finance Programs, op. cit, pp. 84-85.

[24] The fact that Minnesota computed the smaller program calculations for the historically lower-spending districts on the basis of district spending in 1970-71 and formula allowances in later years made it necessary to treat all districts the same. The author wishes to extend his appreciation to Gary Olsen of the Minnesota State Department of Education for pointing out the complexities of the Minnesota formula.

In Table 18 we have presented the differences between the aid levels simulated by each of the alternative wealth measures and the simulated "actual" aid level during the 1975-76 school year. As in the previous table for Kansas, a negative sign refers to a decrease in the subsidy should the corresponding alternative wealth measure be utilized. Table entries represent the median dollar or median percentage change in state aid per pupil.[25]

As can be seen from the table, the changes in the level of state aid per pupil are fairly small, averaging under 10% for most of the regression based wealth measures. Only the rural districts would see an increase in the subsidy level should any of these alternative wealth measures be utilized. For the other three types of districts, however, the addition of an income factor into the wealth or fiscal capacity definition would result in a moderate decline in state aid levels. The decline in aid is most pronounced for the central city school districts, where the use of the basic regression weights would result in a 10-18% reduction in the per pupil subsidy.

Interestingly, the property conversion weighting scheme, with income given the dominant weight, creates the greatest change in the levels of state aid per pupil. While only a 5% average aid increase

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[25] Where necessary to maintain the general order of magnitude of the wealth levels, the millage rate was adjusted to keep the product of the millage rate and the wealth of the median district the same under all of the definitions.

Table 18

State Aid Simulations: Minnesota, 1975-76
Median (Absolute and Percentage) Change in State Aid per Pupil under Alternative Wealth Measures[1]

	Basic Regression Measure		Standardized Regression Measure		Logarithmic Regression Measure		Property Conversion Measure	
Type of District	Change	%	Change	%	Change	%	Change	%
Rural	$ 8	2%	$ 6	1%	$ 2	0%	$ 18	5%
Small Urban (non-SMSA)	- 27	- 7%	- 25	-7%	- 46	-12%	- 204	-53%
Suburban (SMSA)	- 12	- 3%	- 12	-3%	- 26	- 5%	- 107	-23%
Central City (SMSA)	- 49	-10%	- 45	-10%	- 75	-18%	- 254	-78%

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[1] Changes calculated as the difference in the amount of state aid subsidy under alternative wealth measure relative to that amount simulated under current wealth measure.

per pupil would result for rural districts, the other three district types would see very sizeable aid declines. For central city districts, the decline is 78%.

Lastly, the question remains as to what the fiscal neutrality effects of the simulated changes in state aid would be. Until recently, school finance investigators have devoted little attention to the specific statistical tests which should be used to measure the fiscal neutrality of a given school finance system. Robert Berne has presented probably the most comprehensive survey of the potential measurement devices.[26] Although it is only one of a number of bivariate measures which might be used, the measure which we shall use here is the Pearson product-moment coefficient of correlation (r).[27]

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[26] Robert Berne, "Alternative Equity and Equality Measures: Does the Measure Make a Difference?," in E. Tron, Ed. Selected Papers in School Finance. 1978 (op. cit.), pp. 1-57.

[27] It is important to note that the Pearson product-moment coefficient of correlation (r) is a satisfactory statistic for determining whether or not fiscal neutrality exists: i.e., whether wealth and spending per pupil are related. However, it will generally not indicate the magnitude of the spending inequalities which the wealth differences have generated. A simple example will indicate this. Suppose there are three districts, whose fiscal capacities and per pupil spending levels are as shown below.

	A	B	C
Fiscal Capacity	$100	$200	$300
Exps. per Pupil	499	500	501

As can be seen, the difference in the fiscal capacities of the three districts is sizeable here, and the level of expenditure per pupil is positively (and perfectly) related to the level of fiscal capacity. The coefficient of correlation would equal +1 in this case. However, the difference in expenditure per pupil across the three districts is obviously very slight and certainly not a matter of concern.

Some researchers have suggested using the regression coefficient calculated by regressing spending per pupil on wealth per pupil as the appropriate measure of fiscal neutrality. This statistic, however, also suffers from a major shortcoming. Given two alternative wealth measures, it is generally not sufficient to claim that the wealth measure with the lower regression coefficient is indicative of greater fiscal neutrality. The dispersion of the inter-district wealth distribution must also be taken into account.

In Table 19 have been listed the correlation coefficients between spending per pupil and district fiscal capacity as defined by our various capacity measures. The table should be analyzed with some caution, however. First of all, the correlation coefficient between actual total spending per pupil and the actual wealth level in Minnesota for the 1975-76 school year (line 1) is seen to be +.22. Although the magnitude of r is not large, it is statistically significant at the .01 level. In short, fiscal neutrality did not exist in Minnesota in 1975-76. Because of the complexities involved in including categorical aid in the simulations, we first simulated actual spending per pupil net of categorical aid as the sum of expenditures based on local revenues and the level of state subsidy aid. As can be seen in line 2, the correlation-coefficient between simulated actual spending (net of categorical aid) and actual property wealth is a negative (-.14). In other words, this finding implies that the effect of categorical assistance is to favor the wealthier districts. Interestingly, our three regression based wealth measures [lines (3), (4), (5)] are not significantly correlated with simulated actual spending, and might be said to be "fiscally neutral" with the exclusion of categorical aids. Of all our alternative wealth measures, only the property conversion wealth measure seems to produce a decidedly non-neutral effect, with an r = -.17.

Table 19

Pearson Correlation Coefficients between Spending per Pupil and Various Measures of District Wealth: Minnesota, 1975-76

Line	Wealth Measure	Spending per Pupil
(1)	Property per Pupil	.22**[a]
(2)	Property per Pupil	-.14**[b]
(3)	Basic Regression Wealth Measure	-.08[b]
(4)	Beta-Weighted Wealth Measure	-.09[b]
(5)	Log-Weighted Wealth Measure	-.07[b]
(6)	Property Conversion Wealth Measure	-.17**[b]

*significant at $\alpha = .05$, two-tailed t-test
**significant at $\alpha = .01$, two-tailed t-test

[a] Based on actual expenditures per pupil for 1975-76 school year, including categorical aid.

[b] Based on simulated expenditures per pupil, excluding categorical aid.

Ohio Aid Simulations.

In 1975 Ohio adopted a guaranteed yield form of state aid formula for subsidizing local school districts. The operation of the plan was quite simple. The formula guaranteed $48 per pupil for the first 20 equalized mills and $42 per pupil for each equalized mill in excess of 20 mills up to a limit of 30 mills. For the year analyzed here, however, the guaranteed yield plan was not yet fully funded.[28]

As we have previously done for the other states, we have simulated the levels of state aid by district type which would result from our alternative definitions of school district wealth and compared them with the (simulated) actual levels of state aid which would have occurred under a fully-funded Ohio guaranteed yield plan in 1977-78. The results are listed in Table 20.

As is evident from the table, the changes in the level of state aid are extremely small for the case of our three regression-weighted schemes, the average change being only about 2%. The property-conversion weighting scheme seems to have a more pronounced effect, lowering the level of per pupil state aid to rural and suburban districts, while raising the level of aid to small urban and central city school districts. None of the alternative wealth schemes produce sizeable changes in the level of state aid, however. This finding is quite consistent with our previous observation that none of our alternative wealth measures appreciably affected the average wealth rankings among districts in Ohio.

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[28] See Robert H. Wessel, "Why Guaranteed Yield Failed in Ohio," Journal of Education Finance, 3 (Winter, 1978), p. 265-71.

Table 20

State Aid Simulations: Ohio, 1977-78

Median (Absolute and Percentage) Change in State Aid per Pupil under Alternative Wealth Measures[1]

	Basic Regression Measure		Standardized Regression Measure		Logarithmic Regression Measure		Property Conversion Measure	
Type of District	Change	%	Change	%	Change	%	Change	%
Rural	-$16	-2.8%	$ 6	1.0%	-$19	-3.3%	-$20	- 3.5%
Small Urban (non-SMSA)	- 10	-2.5%	12	2.3%	- 9	-2.1%	12	3.1%
Suburban (SMSA)	- 23	-3.8%	0	0.0%	- 29	-4.9%	- 62	-10.6%
Central City (SMSA)	- 7	-1.6%	19	4.6%	- 2	-0.5%	34	11.0%

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[1] Changes calculated as the difference in the amount of state aid subsidy under alternative wealth measure relative to that amount simulated under current wealth measure.

It is not surprising, therefore, that when we analyze the fiscal neutrality effects of our alternative wealth measures, we find that there is little change in the correlation between district spending and wealth under our various schemes. As Table 21 shows, the current Ohio system is decidedly non-neutral, with the coefficient of correlation between spending per pupil and wealth exceeding .60. Furthermore, there is not much variation in r, the sole exception being for the property-conversion scheme. Somewhat surprisingly, the value of r drops to .15, still highly significant but lower than under either the existing property per pupil measure or under our regression-based weighting schemes.

Pennsylvania Aid Simulations.

For several reasons which will be noted below, we did not simulate the difference in the state aid subsidy which would be forthcoming to Pennsylvania school districts under the various alternative wealth measures. In the first place, the Pennsylvania legislature did not appropriate sufficient funds for the new Pennsylvania subsidy formula which was set up by Act 59. Consequently, the formula has not been fully implemented. Instead, the state has decided to figure district entitlements under the previous law, then disburse by the new formula what extra funds the legislature did add. This practice has prompted a recent suit on the part of 122 school districts challenging the method of disbursing the subsidies.[29]

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[29] G. Kocher, "Schools Sue Over Subsidies," Allentown Morning Call, February 28, 1979, p. B1.

Table 21

Pearson Correlation Coefficient between Spending per Pupil and Various Measures of District Wealth: Ohio, 1977-78

Line	Wealth Measure	Spending per Pupil
(1)	Property per Pupil	.68**[a]
(2)	Property per Pupil	.61**[b]
(3)	Basic Regression Wealth Measure	.64**[b]
(4)	Beta-Weighted Wealth Measure	.63**[b]
(5)	Log-Weighted Wealth Measure	.65**[b]
(6)	Property Conversion Wealth Measure	.15**[b]

*significant at $\alpha = .05$, two-tailed t-test
**significant at $\alpha = .01$, two-tailed t-test

[a] Based on actual expenditures per pupil for 1977-78 school year, including categorical aid.

[b] Based on simulated expenditures per pupil, excluding categorical aid.

Moreover, in a recent article Russell Harris[30] has analyzed the fiscal neutrality implications of the "new" Pennsylvania subsidy scheme. Harris used both the Gini coefficient and the regression coefficient as measures of wealth neutrality. He concluded that:

> The new system maintains a significant relationship between the amount of local wealth and the total revenues available to school districts as indicated by only a slight decline as in the wealth regression coefficient from .3596 under the old system to .3520 as a result of the new legislation. Likewise, the Gini index for total revenues available to school districts declined from .0809 to .0764.[30] [The decline indicated only a very slight movement toward greater fiscal neutrality].

A third reason for refraining from simulating the changes in state aid under the new Pennsylvania formula according to our various alternative wealth measures was the size of the weights which we estimated. As already discussed, the weights which we observed for our three regression based wealth measures were very close to the actual 60-40 weighting scheme currently in use under the Act 59 system.

In light of these reasons, it was decided to exclude Pennsylvania from the aid simulation exercises.

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[30] Russell Harris, "Act 59 and the Prospects for Reforming School Finance in Pennsylvania," Journal of Education Finance, 4 (Spring 1978), pp. 487-501.

Conclusions: State Aid Simulations.

For the three states whose state aid levels were simulated in accordance with our alternative wealth definitions, the following conclusions may be drawn. In the cases of Kansas and Minnesota, the assignment of moderate weights to income produced modest changes (less than 10% usually) in the level of state aid to the average district. In general, the average state subsidy to rural districts would rise while subsidies to the other three district types would fall. Only a dominant weight assigned to income would produce a sizeable change in the average level of state aid. For Ohio, on the other hand, the inclusion of income--even with a heavy weight--would have only a very small effect on average state subsidies.

Because of the statistical difficulties in accurately measuring fiscal neutrality (see footnote 27, page 77), considerable caution must be exercised in drawing conclusions here. We have observed, however, that the level of spending and the currently-measured level of district wealth are positively correlated for the states of Minnesota and Ohio. Broadening the fiscal capacity measure to include income resulted in a fall in the value of the correlation coefficient in Minnesota, but (except for the property conversion scheme) little change in the correlation coefficient for Ohio. For reasons previously discussed, the fiscal neutrality analysis did not include the states of Kansas and Pennsylvania.

CHAPTER IV

Summary and Conclusions

It has been argued that measures of school district fiscal capacity which include only property wealth may be too narrow. The dissatisfaction with such measures has led to frequent suggestions that income be included as an additional component of fiscal capacity. As of the late 1970's, seven states have followed such suggestions and are now using fiscal capacity indices which include both property and income.

The question of the appropriate weights to associate with these two factors has been largely ignored, however. The weighting schemes currently utilized in the state formulas which now include income reflect either political compromise or arbitrariness. Under the plausible assumption that differences in weighting schemes can generate perhaps sizeable differences in district wealth and aid levels, the question of the appropriate weights deserves consideration. In the present paper we have considered two alternative types of additive weighting schemes. The first was based on the premise that actual differences in district spending behavior should on the average reflect the relative importance of property wealth and income. "Fiscal capacity is as fiscal capacity does" tersely expresses the empirical rationale behind this first weighting method. Multiple regression analysis was the statistical technique used for deriving the weights. The second weighting method which we considered was based on a theoretical approach previously used by Walter McMahon, according to which property was considered as convertable into an income flow or annuity per period. This, in turn, could be added to current income to produce a more comprehensive measure of a district's ability to finance education. In effect, the property conversion rate is conceptually equivalent to a weight for property.

The results of the two approaches were quite different. For the four states which served as the bases for the derivation of the regression weights, the weights accorded property usually averaged 60-80%, while those accorded income averaged only about 20-40%. By way of contrast, the property-conversion scheme yielded a weight of only 8% for property, compared to a weight of unity for income.

In Chapter III, the consequences of using these alternative weighting schemes were examined with reference to each of the four states. It was found, first of all, that the inclusion of income in a fiscal capacity measure would reduce slightly the variation in fiscal capacity across districts. The heavier the weight given to income, the lower (generally) the variability. The results of the weighting schemes differed, however, according to district type. The inclusion of income usually had the effect of reducing the fiscal capacity of the average rural school district. On the other hand, there was a general (though not universal) tendency for the average fiscal capacities of small urban and suburban districts to rise if income was included. Usually, the heavier weight given to income, the higher the index of relative fiscal capacity. For the case of central city districts, no clear tendency emerged. In two states, the inclusion of income increased the index relative fiscal capacity of central city districts, and in two states it resulted in a decrease.

When state aid levels were simulated, much the same story as that of the wealth simulations emerged. Rural districts, on the average, would see an increase in their aid levels if income were included with a moderate weight, while urban and suburban districts would witness a decline in aid per pupil. In general (except for Ohio), the heavier the income weight, the larger the change in the level of state aid.

As a final note, we think that it is necessary to point out that there is no single "correct" or clearly superior method of weighting income and property wealth in a measure of fiscal capacity. The additive weighting schemes used here have the advantages of possessing a sound logical basis and being simple to construct and interpret. However, what we have observed is that assigning a moderate weight to income in an additive fiscal capacity index would usually _not_ produce sizeable changes in the average level or dispersion of school district fiscal capacity in the states studied. Only an extremely large weight given to income (such as in the McMahon scheme) is capable of generating such sizeable changes. It is important to note, finally, that the conclusions regarding the magnitude of the changes are valid _only_ for additive weighting schemes. Under a _multiplicative_ weighting scheme (such as that used in Connecticut and Rhode Island), the resulting changes in wealth and aid levels might well be considerably greater.

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MUNICIPAL OVERBURDEN: ITS MEASUREMENT AND ROLE IN SCHOOL FINANCE REFORM*

Over the past decade, ever since the landmark Serrano v. Priest case in California, the funding of public education has undergone court challenge in a number of states. The thrust of the court challenges have either been the highly unequal per pupil spending levels that exist within many states, or the great variation in financing abilities across local school districts caused primarily by a heavy reliance on local property tax revenue. Both of these problems have been addressed by new state funding formulas that have been adopted during the last several years in a number of states.[1] Despite this flurry of activity, several analysts have recently suggested that the net effect of many of these reform efforts has been little or no improvement in the equity of the school funding system.[2] In particular, there is some evidence that despite large increases in state aid, the ability of many of the nation's large city school districts to provide adequate funding for public education may be worsening. The claim is made that cities' ability to support local schools is constrained, not necessarily by inadequate wealth, but rather by greater non-educational demands for local resources. These higher non-educational demands on the local tax base result primarily from generally higher costs of providing services in cities, and from extra public services that tend to be required in cities.

This argument has served as the basis of a recent court decision in New York. In Levittown V. Nyquist the Court ruled that a state funding system that equalizes resources among school districts is insufficient. The differential costs faced by some large cities in order to provide non-educational public

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services, places a drain on the resources available for the funding of public education. The Court in New York suggested that higher non-education expenditures in many cities are in fact required in order to produce essential services in those cities. Similar arguments have been made in a case that is currently pending in Maryland.

Both the education literature and the New York courts refer to the relationship between educational funding and municipal expenditures as municipal overburden. We shall argue in this paper that although the term municipal overburden is widely used, it has never been well defined. Without a generally accepted definition it is impossible to determine in which cities municipal overburden is a problem, and whether the concept has a relevant role in school finance reform.

The issue of municipal overburden can most usefully be thought of as two separate questions. The first involves measurement of the burden which residents of various jurisdictions must face in order to provide for municipal services. This is in fact the issue addressed by a large number of attempts to measure urban fiscal stress (or perhaps, distress). The second part of the municipal overburden question involves local government's response to the existence of fiscal stress: under what circumstances do local governments respond to fiscal stress by reducing their financial support of education? The implication of this question is that local governments may not respond at all to municipal fiscal stress by reducing spending on education.

A final issue related to municipal overburden concerns the policy question of whether, and how, the existence of municipal overburden should play a role in the distribution of state aid. Even if the problem of municipal overburden is clearly defined, it is a difficult task to design grant-in-aid instruments that compensate local school districts for their municipal overburden.

This paper addresses these three issues. We first turn to a review of the literature that has attempted to measure both municipal overburden and fiscal stress. We then describe an alternative measure of fiscal stress that, we believe, can overcome some of the shortcomings of the existing literature. We then turn to the question of the relationship between fiscal stress and education expenditure levels. We briefly review the literature, and suggest why the empirical results are so ambiguous. Finally, we suggest a number of ways in which state school aid formulas can be modified to deal with municipal overburden.

Existing Measures of Municipal Fiscal Stress

The education literature includes a number of attempts to demonstrate that larger cities face, on average, greater burdens in providing municipal services, and hence, are less able to finance adequate levels of public education. For instance, Gutherie, Kleindorfer, Levin and Strout (1971) argue that ". . . the residents of some school districts, particularly urban ones, are vulnerable to paying property taxes for many more purposes than simply the support of schools. These additional taxes are frequently referred to as municipal overburden"[3] (p. 119). Alternatively, Sacks (1974) defines municipal overburden in terms of local school expenditures as a percentage of total expenditures. He notes that this ratio is lower in central cities than in suburbs, implying higher non-education expenditures in the cities. Other authors define municipal overburden in terms of higher levels of non-educational expenditures in cities, higher property tax rates in cities, and smaller proportions of total tax levies devoted to schools in cities.[4]

Data from a large number of states support the contention that in general municipal tax levies are highest in large cities, while educational expenditures as a proportion of school expenditures are considerably lower in cities as compared to their suburbs. For example, in a study of New Jersey communities Reschovsky and Knickman (1976) report that municipal taxes per capita were on average 26% higher in large urban communities than in non-urban communities. Likewise, in urban communities school expenditures averaged 42% of total local expenditures as compared to 56% in non-urban communities.

These measures of fiscal stress are all seriously flawed. Although they are undoubtedly reasonable correlates of fiscal stress, none of them provide adequate and accurate measures of municipal fiscal stress. The deficiencies of the measures are due to two important failures. First, they do not control for the level of public services provided. For instance, a community with high tax levies or high levels of municipal expenditures may not be heavily burdened by public sector responsibilities, but rather may have, through the political process, chosen to provide high levels of services. Thus, unless we can control for differing preferences for public services, measures of tax or expenditures levels are insufficient as indices of fiscal stress.[5] The second reason why high levels of per capita expenditures, or small tax bases, are not necessarily good indicators of fiscal stress is that these measures fail to indicate whether the local taxpayer in fact faces a relatively high local tax burden. The receipt of intergovernmental grants, or the ability of local taxpayers to shift or "export" their tax burden to non-residents, may both result in high expenditure and/or low tax base communities whose residents are not fiscally stressed.

In recent years there have been widespread efforts to improve on early measures of fiscal stress. Papers by Barro (1978), Bradbury (1979) and Cuciti (1978) review this literature, and discuss the definitional and measurement

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issues involves in constructing indices of urban fiscal stress. Bradbury draws the very useful distinction between "budgetary" and "citizen" fiscal distress. The former refers to the type of problem that faced New York City, namely difficulties in balancing the municipal budget, while the latter involves difficulties in providing residents with acceptable levels of public services at reasonable tax rates. Both types of problems (which can occur simultaneously) are related to what Bradbury calls "structural" fiscal distress. Structural distress exists when cities face underlying problems that lead to long-run difficulties in obtaining adequate resources to meet local needs.

An example of an attempt to build a structural stress index is Nathan et al.'s (1977) "urban conditions" index. The purpose of their index is to point out which cities have high public service "needs." The index does not measure relative "needs" directly. Rather, three variables which are thought to be related to relative fiscal needs are the basis for comparison across cities. The three factors chosen by Nathan et al. are (1) percent of housing built before 1939, (2) percent of the population with below poverty level incomes, and (3) rate of population change. The three factors are weighted equally in the index. In general high values of the index are generated for cities that urban experts would consider fiscally stressed "high need" cities. For example, Newark and St. Louis, two cities on most lists of stressed cities, are near the top of the "urban condition" index.

The main advantage of the index is its simplicity. The mechanics of the index are easy to understand, but the simplicity, of course, is achieved at the expense of a clear conceptual underpinning. In fact, the index is rather ad hoc in character. Also, it is not clear that the index is sensitive to the impacts of existing federal and state aid on the ability of local governments to pay for necessary services, or to the amount of tax burden that is exported.

In an intriguing recent paper Aaron Gurwitz (1977) suggests that a community is experiencing fiscal stress if it is raising local tax revenues above a "maximum sustainable level." Excessively high tax rates will induce residents and businesses to leave a community. This fact enables us to define a tax rate that will in the long run maximize local government revenue. Any higher tax rate will not be sustainable in the long run because it will reduce the level of local economic activity, and eventually reduce aggregate revenues. Gurwitz's index has the advantage of clarifying the fact that resources for public education and for municipal services come from the same pool of resources. However, empirical estimation of the index will be very difficult, as its data requirements are extremely large.

An Alternative Index of Fiscal Stress

Ideally an index of fiscal stress should measure the burden faced by the average resident in order for his local government to meet local "needs." In other words, in defining an index of fiscal stress a distinction should be made between the tax burden created by providing necessary services, and the burden of public provision of discretionary services. In order to demonstrate why some communities have more public service needs than others, and why the costs of providing for such needs vary across communities, it is useful to decompose the determinants of local government expenditures.

Define g_i as the quantity of a composite local public service provided per capita on an annual basis in community i; g_i is thus a measure of the output of local government. For example, the output of a police department might be measured in terms of a reduction in the probability of a given type of crime occurring. Annual per capita local government expenditures can be defined as the product of g_i and p_i, the cost per unit of public output. Thus per capita expenditures vary across communities because of variations in output, or in the price (or cost) per unit.

There are several reasons for differences in output levels. First, communities vary in their ability to pay, or fiscal capacity. Demand for public output is generally positively related to the size of a community's tax base, and the level of intergovernmental grants received. The second factor that affects local demand for public goods is the existence of legal requirements mandated by statute or the courts which require that certain levels of services be provided. Also, certain services are considered necessary by the standards of the time or the region. For example, by the standards of the eighteenth century public fire protection was not considered a required municipal service even in the largest cities, while today all large cities would consider it one of the basic functions of local government. Clearly many standards of public service, whether legally mandated or not, are determined by certain technical characteristics of a jurisdiction, rather than by citizen preferences. For instance, the decision to have publicly provided sewers rather than private septic tanks is usually determined by the type of soil and drainage conditions in the community.

Finally, the demand for public goods is affected by preferences or tastes for public goods. Depending on the degrees of responsiveness or local government to its citizens' preferences, the relevant preference may be the collective tastes of the citizenry for public goods, or the preferences of the political leaders. An index of fiscal stress should reflect only intercommunity differences in required public sector demand not due to differences among communities in their preferences for public goods.

The degree of fiscal stress faced by any community depends not only on the public services it is required to provide, but also on the costs per unit of public service. To understand the reasons for interjurisdictional cost differences we assume that the per capita production of public goods in jurisdiction i can be represented by:

$$g_i = F(X_i, N_i)$$

where X_i are the "facilities" available for production of g_i, and N_i, the population of the community.[6] The term facilities refers to a combination of inputs: labor, land and capital necessary to produce public output of g_i. The facilities for safer streets, the output of a police department, might be a given number of police patrols. Each patrol requires one or two policemen, a police car, gasoline, and a communications network. Similarly, the facilities necessary to produce educated children include teachers, classrooms, and books.

There are three major reasons why per unit public service costs differ across communities. The first factor is the degree of "publicness" involved. For some public goods, additional population will have little impact on service levels and hence on costs. For other public services, or under conditions of congestion, an extra person will significantly reduce the average level of g_i, and thus require additional facilities, and costs, to maintain service levels. The composition of population can also have an impact on costs. For example, there is significant evidence that more educational resources are needed to provide a given quality of education to children from poor families than to middle-class children.[7] Hence, an increase in the proportion of poor children in a community will increase costs if education "output" is to be maintained.

Costs of producing public services also vary across communities because the relationship between g_i and X_i varies. In some communities facilities are used more efficiently than in other communities. Efficiency differences may be a function of scale economies, inefficient factor mixes, or low factor productivity. Also, certain pure technical factors may require particularly large amounts of facilities to achieve a given level of per capita public service. For example, the provision of adequate fire protection in communities with high-rise buildings requires special facilities (i.e., hook and ladder trucks) not necessary in other communities.

The final factor that affects costs are variations in factor prices. Large cities generally face higher factor costs than smaller jurisdictions. Labor costs dominate municipal budgets, and on average salary levels for municipal employees are positively correlated with jurisdictional size. According to a survey conducted by the International City Managers Association (1979), the mean starting salaries for policemen, firemen and refuse collectors are approximately $4000 per year higher in cities with over one million population than in cities with between ten and twenty-five thousand population.

The above discussion should make clear that the costs of providing necessary or required public services will vary substantially across jurisdictions. In general we expect that not only will the amount of necessary public services be greater in large central cities, but the costs of providing these services will also be higher than costs in smaller cities. Controlling for differences in tax base and in receipt of grants, communities facing high public sector costs will face the highest tax burdens. If we call a community's required public services its "minimum bundle," then we can measure fiscal stress as the tax burden necessary to finance a minimum bundle of municipal services.

The actual construction of such an index requires that we be able to (1) define each community's "minimum bundle" of public services, (2) estimate the costs of each minimum bundle, and (3) calculate the tax burden faced by a typical resident in order to finance the minimum bundle. In the next several paragraphs we shall suggest a method of constructing such an index of fiscal stress.

As minimum bundle expenditures are not directly observable, the first problem is one of determining the composition and cost of each community's non-discretionary (minimum bundle) public services. One approach to separating discretionary from non-discretionary expenditures would be to analyze municipal budgets on a line to line basis. However, this detailed approach is unlikely to be fruitful because typical budgets do not break down factor costs by the type of service provided. For example, budgets provide little evidence on how much of police salaries are compensation for required, as opposed to discretionary, activities. Only if municipalities maintain program budgets will budgetary data prove to be useful. Unfortunately, very few local governments construct true program budgets.

In a previous study (Reschovksy and Knickman, 1976), we chose an alternative, statistical, approach that starts with the estimation of a reduced form expenditure function.[8] In specifying this function the goal was to employ a set of demand and supply side variables that as closely as possible reflect the particular needs of each community, and the factors that determine the costs of meeting these needs. Thus the regressions include variables reflecting differences in public sector technology, factor prices, and public sector congestion. For example, drawing on a previous example, the presence of high-rise buildings will be an indicator of the necessity of having highly trained professional fire fighters, rather than volunteers, and will also reflect the technical fact that high-rise buildings require more costly equipment (i.e., "facilities") to combat potential fires. Variables reflecting population size and composition will be important determinants of both the scope and cost of the community's minimum bundle of public services. For example, given current legislation and societal mores, a concentration of poor elderly people within a community may necessitate the public provision of certain health care services, and may increase the costs of providing other services, such as public safety and recreation.

The important element in the specification of these expenditure equations is that the set of independent variables used should explain as completely as possible the costs of a minimum bundle of public services. The difference between total municipal expenditures and the cost of the minimum bundle reflect local discretionary expenditures. These are determined by local preferences or tastes, which are implicitly included in the regression residuals.

Estimates of the costs of each community's minimum bundle are derived by calculating predicted expenditures using community specific values of all independent variables, except for fiscal capacity. The actual value of fiscal capacity in each community is replaced in the estimated equation by the value of fiscal capacity judged to be the minimum necessary for the financing of required public services. The resulting prediction provides an estimate of the costs in each community of providing a minimum bundle of public services. In essence, the regression approach is a method of weighting various factors that determine the composition and costs of necessary public services in a manner that is related to their relative effects on actual expenditures. Thus it is a statistical approach to combining these factors into an index, rather than a purely ad hoc approach such as that used by Nathan et al.[9]

The final step in constructing our index of fiscal stress is to determine the tax burden on the average resident required in order to finance the local minimum bundle of public services. This is accomplished by subtracting revenues received from other governments in the form of grants-in-aid from the costs of the minimum bundle.[10] The total locally raised costs of the minimum bundle are then divided by an appropriate measure of fiscal capacity in order to determine the tax burden necessary to finance a minimum bundle of public services.[11]

As the property tax is the dominant source of local revenue in many states, the market value of real property is an appropriate measure of fiscal capacity in those states.[12] However, if, as suggested by Helen Ladd (1975), some proportion of the tax on commercial-industrial property can be shifted to residents through higher product prices, the fiscal capacity measure should be reduced to reflect this shifting of the tax burden.[13] Where commercial-industrial property is part of the tax base, the cost of providing public services for this property should be included in the costs of the minimum bundle. In states where local governments rely on revenues from non-property tax sources, fiscal capacity measures should reflect these broader tax bases.

In a preliminary study, relying on data from a sample of 62 local governments in New Jersey, we constructed a fiscal stress index using the methodology described here (Reschovsky and Knickman, 1976). The resulting index indicated that Newark had to levy a seven percent tax rate to raise the local portion of the cost of its minimum bundle while Englewood Cliffs, a wealthy suburb, levied just a one percent tax to pay for its minimum bundle. Municipalities classified by the state government as low socioeconomic status (SES) and urban had an average fiscal stress index of 3.9%, while suburban communities had an average index of 0.6%. However, it is interesting to note that among cities classified as urban many had reasonably low levels of fiscal stress. This emphasizes the fact that not all cities experience fiscal stress.

Although we believe our index of urban fiscal stress overcomes some of the deficiencies of stress indices found in the literature, it is not without its serious shortcomings. The potentially most serious problem involves the regression technique used to estimate the cost of a minimum bundle of public services. Certain variables that may be important in explaining cost variations in required services may also help explain variations in preferences for discretionary public services across jurisdictions. Alternatively, variables that have been excluded from the regression because they explain preferences for discretionary public services may prove to be highly correlated with included variables that explain variations in the costs of required services. The consequence of either of these events is that the estimated cost of the minimum bundle of services will be biased.[14]

The problem is a difficult one. However, it cannot be circumvented with an ad hoc index which arbitrarily weights variables thought to be related to need; the potential correlation of these variables with taste factors remains no matter what weighting procedure is used.[15] We should emphasize, of course, that despite the potential bias of the regression based procedure, the bias is likely to be much smaller than if total expenditures are used as an index.

Municipal Overburden and Educational Expenditures

During the 1970s courts in a number of states have declared state education funding systems unconstitutional. In addition, several constitutional challenges to educational funding are still pending. Although no two cases are identical, nearly all of them are based on one of two major arguments. In cases such as Robinson v. Cahill in New Jersey, the Court has ruled that the state must guarantee that all children receive a "thorough and efficient" education. In other words, the court has interpreted the state constitution's "education clause" to mean that the state is responsible for guaranteeing that all students receive an acceptable level of education. In most states the term "acceptable" has been defined either as a minimum level of per pupil expenditures or a reduction in the inter-district variance in expenditure levels.

In other states, the courts have focused on state constitutions' "equal protection" clauses.[16] The argument, first articulated in Serrano v. Priest is not directly concerned with the equality of educational expenditures, but rather with the unequal spatial distribution of property tax base within a state. The Serrano court ruled that equal protection requires that education spending levels not be directly related to differences in local school district fiscal capacities. This criterion,often called fiscal neutrality or taxpayer equity, is satisfied when taxpayers in two communities that have chosen equal tax rates, enjoy equal per pupil expenditure levels.

A significant number of the school finance reform efforts that have occurred during the 1970s have been addressed to the courts' first concern -- the equality of educational output. The courts in several states have mandated state legislatures to increase state funding of education in such a way as to reduce wide variations among school districts in per pupil spending levels. When appropriate adjustments are made to reflect the generally higher costs of providing education in large cities, per pupil spending levels are usually found to be lower in cities than in many suburban communities. For example, in 1978 in New Jersey the average low socioeconomic status urban school district spent nearly $200 less per pupil than the average suburban district characterized as high socioeconomic status. This pattern exists even though no adjustment was made for higher costs in urban districts and after a major court mandated reform substantially increased state aid to education in New Jersey.

The claim is made that a major reason for lower spending levels in urban communities is the fiscal stress under which many urban communities operate. The implication of this claim is that cities that are fiscally stressed respond to the higher burden of providing municipal services by reducing expenditures on education. It is in effect this behavioral response to fiscal stress that characterizes the problem of municipal overburden. Thus from the perspective of courts and legislatures interested in reducing inter-district variations in education spending levels, municipal overburden is a relevant concern only if fiscally stressed communities respond to their fiscal distress by reducing spending levels on education.

As education and non-education municipal expenditures must compete for the same resources, any simple model of local government behavior can establish an interdependence between education spending levels and municipal fiscal stress.[17] With fixed levels of wealth, local residents must trade off levels of each type of public service, and levels of privately purchased consumption goods.[18] Despite this fact and despite several attempts to empirically explore the relationship between fiscal stress and education expenditure levels, there exists no good empirical evidence establishing this relationship.

←——For example, Brazer and Anderson (1975) found a negative relationship between the tax rate for municipal services and education expenditures using Michigan data, but the negative coefficient was not statistically significant. Ladd (1975) included a variable that measured non-education expenditures per pupil in an education expenditure equation estimated with data from Boston SMSA school districts. The coefficient of the non-education expenditure variable, however, was not significantly different from zero.

In contrast to Ladd's results, Grubb and Michelson (1975) found some evidence suggesting a negative relationship between school expenditures and the level of non-school expenditures. Non-school expenditures were most important in influencing education expenditures in high population areas.

Unfortunately, there have been no adequate studies of the relationship between fiscal stress and educational expenditures. All of the previous studies used very crude measures of fiscal stress, namely municipal tax rates or expenditure levels. As we have discussed above, these measures are inadequate as measures of stress. In addition, an appropriate test of the stress-expenditure relationship will require more complex specifications than found in the existing literature. One problem is that measures of fiscal stress tend to be highly correlated with the explanatory variables commonly found in education expenditure functions.

The question of the relationship between urban fiscal conditions and education expenditure levels is important and requires further research if the courts continue to require that legislatures come up with more effective mechanisms for reducing inequities in per pupil spending levels. Unless empirical evidence can be found that high levels of fiscal stress adversely affect spending on education, municipal overburden is not a problem that is relevant to policymakers concerned with the level of per pupil spending on education.

Meeting the judicial objective of fiscal neutrality, however, is not dependent on the behavioral response of local governments to the existence of fiscal stress. Defining fiscal stress in terms of the costs of a minimum bundle of municipal services, a fiscally stressed city can maintain adequate education spending levels only by burdening its citizens with extraordinarily high overall tax rates. Clearly fiscal neutrality cannot be achieved unless compensation is made for the existence of fiscal stress.

The courts will have to decide whether this problem is within the appropriate domain of education policy. The discussion presented in this section suggests that a state court's decision concerning the relevance of the municipal overburden issue should vary depending on whether the court ruling is based on a fiscal neutrality argument or an equal opportunity argument.

Accounting for Municipal Overburden in School Aid Formulas

This section focuses on several policy instruments which could be used to eliminate the relationship between municipal overburden and education expenditure levels. Perhaps the most ambitious approach to neutralizing the impacts of municipal overburden would be to institute a grant-in-aid program to local governments from the federal or state governments that would guarantee that every local government could provide its minimum bundle of public services at an identical tax rate.

As an example, it has been estimated that in New Jersey the municipal tax rate necessary to fund a "minimum bundle" of municipal services varies from about one percent of market values in wealthy suburbs to about seven percent of market values in Newark. New Jersey could adopt a formula that would finance the net cost of each community's minimum bundle in excess of the amount that each community could raise on its own by levying a one percent tax on its own property tax base.[19] Under this formula, based on 1975 data, Newark would receive municipal overburden aid equal to six percent of its property tax base, or approximately $250 per capita.

This type of municipal overburden equalizing aid coupled with "power equalizing" education aid would insure that resources available for education are completely independent of local wealth. The municipal overburden aid, however, would be incredibly costly to a state government. For example, accounting for municipal overburden would require a doubling of state aid to Newark. The result would be that nearly 100 percent of Newark's education expenditures would come from non-local sources.

A second strategy for neutralizing the impact of municipal overburden on education expenditures is to increase a community's education aid by an amount related to the expected reduction in education expenditures attributed to municipal overburden. For example, assume that a careful econometric study indicates that for every unit increase in an index of fiscal stress above 100, education expenditures decrease by ten dollars per pupil. Thus, a community with an index of 120 spends $200 per pupil less on average than a comparable town that has an index value of 100 or less. One possible strategy would be to set municipal overburden aid at a level which would stimulate the high municipal overburden community to increase expenditures by $200. This approach would insure that the level of expenditures across districts is independent of the level of fiscal stress as measured by the index used in the formula.

The cost of this approach depends on the degree to which expenditures are stimulated by increased aid. There are many studies concerning the influence of varying types of aid on education expenditure levels.[20] However, there is no research that focuses explicitly on how fiscally stressed cities respond to grants-in-aid. Several recent studies of education expenditures in a number of states have estimated low price elasticities.[21] This implies that school districts tend to increase per pupil expenditures very little in response to high matching rates and matching rates are often highest for fiscally stressed urban school districts.

It is possible that fiscal stress itself may provide a key explanation for the small expenditure response to matching aid. If this hypothesis is true, then the above approach to neutralizing the impact of fiscal stress on education expenditures could be very costly. For example, if just twenty percent of new aid to fiscally stressed communities goes toward increased education expenditures, then it would take $1000 of extra aid per pupil to induce a community to increase education expenditures by $200.

These approaches to neutralizing the impacts of municipal overburden on education expenditures would solve not only most education finance problems in fiscally stressed localities, but also most municipal finance problems. It is not at all clear that school finance reform is an efficient policy instrument for addressing general urban fiscal concerns. Netzer (1974) argues persuasively that ". . . there is no sensible way for the school finance system to remedy all, or even a large part, of the fiscal distress of pauper cities." He notes that general relief from fiscal stress ". . . must come from outside the school finance system, from non-school fiscal measures specifically tailored to the specific circumstances of the cities."

The two strategies discussed so far for neutralizing the impact of municipal overburden on education expenditures are formula approaches. They are also fiscal neutrality approaches in that they equalize the ability to pay and leave each school district free to set tax rates and education expenditures at the locally desired level.

An alternative strategy for neutralizing the impacts of municipal overburden on education expenditures is to directly equalize expenditures rather than to attempt to stimulate equal expenditures or insure fiscal neutrality. Direct equalization of expenditures can be accomplished by mandating education expenditure levels and a level of tax effort. The state would then finance the difference between the costs of the mandated expenditure level and the revenues rasied locally by the mandated tax effort.[22] Alternatively, but equivalently, the state could assume complete responsibility for education financing and then set uniform state-wide tax rates to raise the required funds.[23]

The advantage of this approach is that it neutralizes the impacts of municipal overburden without having to provide large amounts of aid that will be used by local governments to reduce levels of municipal overburden. Full state funding with expenditure limits neutralizes the role of municipal overburden in education expenditure decisions, and, at the same time, leaves the task of designing strategies for eliminating or reducing municipal overburden to urban fiscal policy.

The problem with full state funding is that it restricts the choices of local school districts. Districts cannot choose levels of education expenditures that specifically reflect local preferences for education. Some districts would be forced to spend less than they would freely choose, while other districts would be forced to spend more. Full state funding is generally not popular among wealthy districts that have sufficient resources to allocate discretionary expenditures to education.

In deciding which alternative policy strategy to use for neutralizing the impacts of fiscal stress on education expenditures, state decision makers must choose between two rather unattractive tradeoffs. Either state aid must be greatly increased in order to fiscally compensate for municipal overburden or full state funding with politically unpopular expenditure limits must be adopted.

Perhaps what this suggests is that a complete solution to the municipal overburden problem would be too costly and would conflict too much with other aims of education policy. In this case, a partial solution might make more sense, both politically and educationally. For example, an acceptable compromise might be state-wide funding of a level of education expenditures that is judged to be adequate for providing acceptable education services, and then local freedom to add locally raised revenues to this expenditure level.

Conclusion

In this paper we have explored the impact of municipal fiscal stress on the financing of public education. The relationship between fiscal stress and the level of expenditures on public education is generally referred to as municipal overburden. Because we believe that existing measures of municipal overburden are deficient, we have developed an alternative measure that is based on the premise that public services provided by local governments can be divided into required services, and those that are purely discretionary. The set of required services is determined by a combination of legal requirements, technical requirements, and generally accepted norms or standards of service within the State. In light of this distinction among local public services, we defined fiscal stress in terms of the fiscal effort necessary for each community to provide the required, or "minimum bundle" of services.

In order to define appropriate policy responses to the existence of municipal overburden, it is necessary to know the degree to which fiscal stress affects education expenditure levels. Unfortunately very limited empirical evidence currently exists. Despite this lack of evidence, the courts may require that state education funding systems be adapted to account for municipal overburden. We have demonstrated that this may either prove to be exceedingly costly or may require state mandating of education taxation and spending levels.

The process of making tradeoffs and compromises among educational goals when choosing an education finance system that diminishes or eliminates the influence of fiscal stress on education expenditures involves normative decisions that an analyst cannot make. However, it is important that the implications of alternative strategies be made clear to state decision makers. To do this, more research must be done to determine the degree to which fiscal stress actually influences education funding patterns, and to determine how much aid would be required to neutralize any impacts that fiscal stress actually has on education expenditures.

NOTES

1. The Education Commission of the States (1978) reports that during the 1970s, 25 states have reformed their public education funding structures, many of the reforms mandated by court action.

2. See Carroll (1979) and Knickman and Reschovsky (1980).

3. Coons, Clune and Sugarman (1970) also suggest that the easiest way to measure overburden is to measure local non-educational taxes.

4. See Sacks (1972) and Berke, Campbell and Goettel (1972).

5. A number of recent studies that attempt to measure fiscal stress fail to make any adjustments for differences in public sector preferences. For example, a widely publicized study of fiscal stress in sixty-six cities done by the First National Bank of Boston and Touche Ross and Company (1979) uses actual expenditures per capita in its measure of fiscal stress. In another study, Clark (1977) used per capita expenditures on nine types of public services as a measure of fiscal stress.

6. This approach has been developed more fully in Inman (1977).

7. See, for example, Jencks et al. (1972).

8. See Bahl (1969), Inman (1979), or Wilensky (1970) for surveys of the large literature on determinants of local government expenditures.

9. This use of regression analysis is very analogous to the methodology used to compute educational cost functions. For a discussion of education cost indices see Brazer (1974), Brazer and Anderson (1975), Grubb and Hyman (1975), Chambers (1978), and Wendling (1979). In the case of cost functions, regression analysis is used to distinguish the demand related determinants of wage levels or price levels from supply related determinants. The supply factors are interpreted as reflecting price differences while the demand factors are interpreted as reflecting quality differences. The regression approach to measuring necessary municipal expenditures has also been used by Brazer et al. (1971), Akin and Auten (1976), and in slightly different contexts, by Musgrave and Polinsky (1970), Auten (1974), and Barro et al. (1975).

10. Lump sum grants have a slightly different effect on minimum bundle expenditures than matching grants. All lump sum grants can be used to defray the costs of the minimum bundle, but matching grants are directly related to total expenditures. Thus only those matching grants which are matched to expenditures that are included in the minimum bundle should be subtracted from the total cost of the minimum bundle.

11. Barro (1978) has developed an index of fiscal stress that is similar to the one discussed here. The Barro index is equal to the tax rate that would have to be levied for a town to raise its "expenditure-to-need" ratio to the average level of expenditures in a state. For example, if

a town has 35% more needs than the average town in the state and if the average municipal expenditures in the state are $350 per capita, the index value would be the tax rate needed to finance expenditures of $473 (350 x 1.35). Although this index takes into account varying needs and varying abilities to pay, it also is influenced by the level of average discretionary expenditures in a state. The index discussed in the text, by contrast, measures only the tax rate that must be levied to pay for a town's non-discretionary expenditures. The two indices, although similar, can lead to different conclusions about relative levels of fiscal stress when towns with high needs also have large tax bases.

12. There is a long, and still unresolved debate in the literature concerning the measurement of fiscal capacity. A standard reference is the Advisory Commission on Intergovernmental Relations (1971). More recent discussions can be found in Margolis et al. (1971), and in Akin (1973, 1979).

13. In constructing our fiscal stress index we have ignored the fact that property taxes can be deducted from federal and state taxable income. Accounting for this provision of the tax laws, would reduce fiscal stress in higher income communities and those with a high proportion of homeownership.

14. Economic theory provides no clear guidance as to what variables truly reflect needs versus preferences. Consider, for example, a variable like population density. A legitimate argument can be made that high density increases the need for certain services, such as street cleaning, that are less essential or unnecessary in less dense localities. In addition, the price of services in dense localities tends to be higher in part due to the historical structure of city-rural wage differentials. Thus, one can interpret density as a need variable. On the other hand, it is very possible that citizens in dense localities have different preferences for municipal services than citizens in non-dense localities. For example, parks and public recreation may be far more important to the urban apartment dweller than to the suburban homeowner. Thus, one might also expect density to be correlated with discretionary expenditures.

    One way of reducing this problem is to estimate the equation separately for each expenditure category. Then it would be possible to interpret a variable like density as a need variable in some cases, such as for fire expenditures, but as a taste variable in other cases, such as for recreation expenses.

15. One possible ad hoc procedure for determining discretionary expenditures would be to have a "panel of experts" sit together and decide on a level of non-discretionary expenses that would apply to each expenditure category for each class of cities. Legislatures, and perhaps State courts, might find this approach attractive. The testimony in Levittown vs. Nyquist concerning municipal overburden consisted largely of expert witnesses stating judgments about the relative levels of municipal expenditures in the large cities of New York State.

16. In 1972 the U.S. Supreme Court in Rodriquez v. San Antonio reversed a lower court decision that had declared unconstitutional the Texas system of education finance on the grounds that inequities in per pupil expenditures resulting from the existing system of school finance violated the equal protection clause of the U.S. Constitution.

17. Gurwitz (1977) offers a refinement of the standard economic model that leads to the prediction that in fiscally stressed cities, increased non-discretionary expenditures on municipal services will be financed mostly by decreased education expenditures as opposed to decreased private consumption. He argues that available income for public activity is smaller than total local income because of the potential for out migration of economic activity and of the population. Thus, if a community is spending all of the income available to it for public activities, there is a great deal of pressure to decrease other public activities when the demand for one type of activity increases. If non-discretionary municipal expenditures are high, this must be compensated for by lowered discretionary municipal expenditures and/or lowered education expenditures.

18. A wide variety of formal relationships between school districts and municipalities exist. In some states, they are politically independent. In other states, schools are a municipal government function. In still other areas a middle ground exists, namely, municipal governments have limited budgetary control over school districts. Regardless of the formal structure, we argue that as long as the tax base is shared, a behavioral relationship between municipalities and school districts exists.

19. Of course, a higher mandatory rate could be set but this would necessitate the politically unpopular "recapturing" of funds from wealthy towns, where the revenues raised would exceed the costs of non-discretionary services.

20. See, for example, Ladd (1975) and DiPasquale (1979).

21. See Carroll (1980), DiPasquale (1979) and Welch (forthcoming).

22. The general approach described here is a foundation plan with expenditure limits. It should be noted that expenditures cannot be permitted to vary above the "foundation" because each district's ability to pay for extra expenditures would be affected by its level of municipal overburden.

23. Four states currently have education finance systems that involve virtually equal effort and equal expenditure levels across districts. Only Hawaii has complete state financing. However, New Mexico, Florida, and Minnesota have finance plans that effectively limit education expenditures and tax rates to levels that are homogeneous across each state. See Garms et al. (1978), pp. 199-201, for a good description of these plans.

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